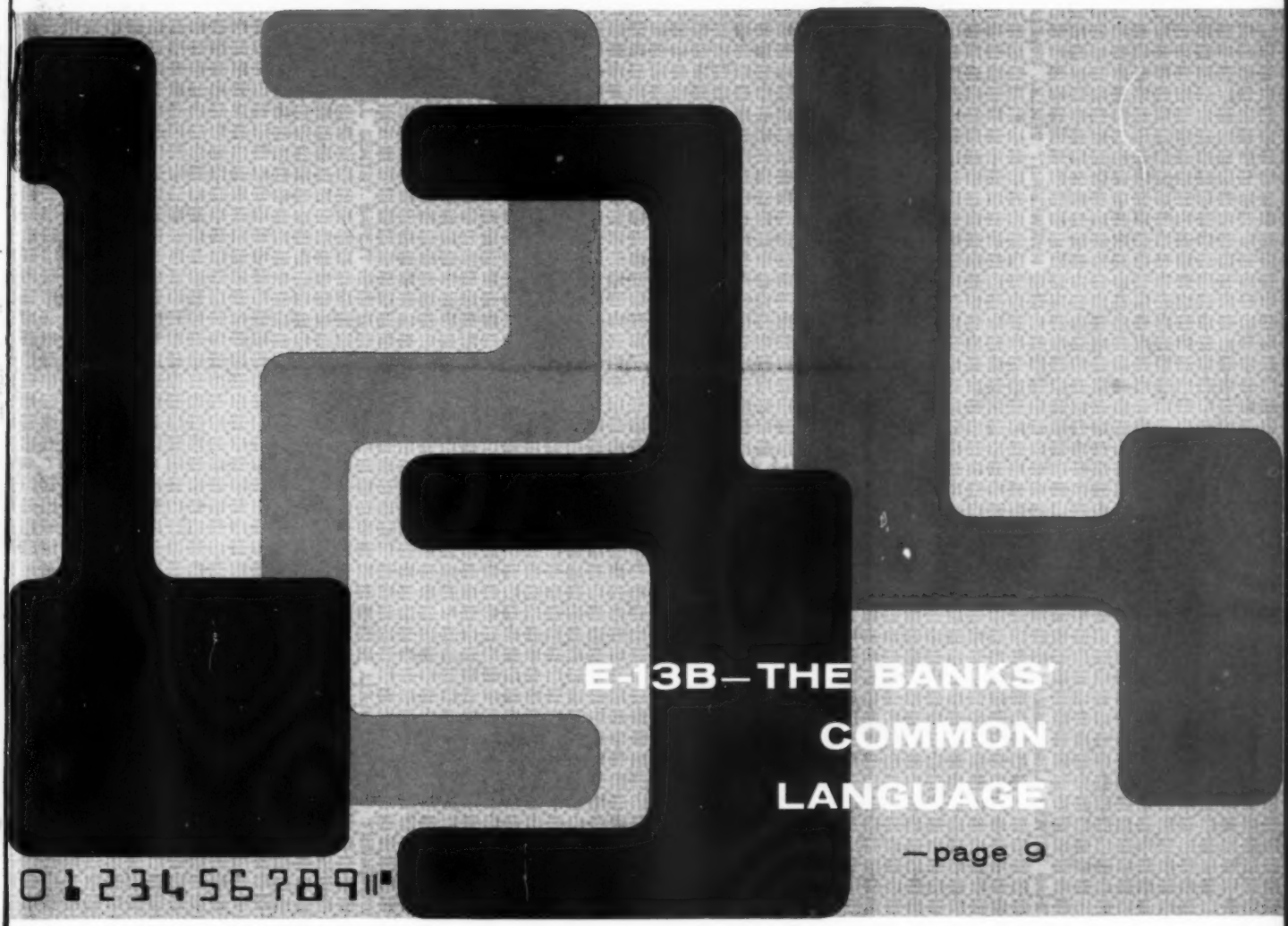
APRIL 1961

# DATA PROCESSING®

THE MAGAZINE OF AUTOMATIC OFFICE METHODS AND MANAGEMENT





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- Computer Census—page 32
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John R. Brougher, Jr., Manager of Data Processing and Computation Department of Texas Instruments Incorporated

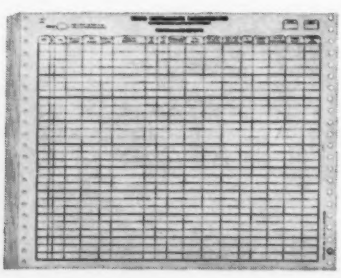
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THE FIRST NATIONAL PUBLICATION ever to recognize data processing as a field worthy of a publication was called *The Punched Card Annual.* This publication was announced before there was even a national association of people engaged in data processing management. It was this publication that first brought us into contact with this field.

Ten volumes of "the Annual" have been published and the eleventh volume has been released to the printer except for a few directory sections that require last minute updating and verification. *(Eight volumes appeared in the first series and two volumes have been published in a new series.)*

The first eight volumes of the Annual are now out of print. The name has since been changed to simply *Data Processing Annual* as we believe the term "data processing" properly encompasses punched card as well as computer methods. The new series has been greatly expanded from earlier editions and the life span of each volume has been greatly increased with the addition of substantial cloth binding.

The most important changes in the new *Data Processing Annual,* however, go far beyond the name and general physical characteristics. They lie in the editorial content of the material. We believe that no other source gives so much valuable reference material for a price well within the reach of every data processing equipment user.

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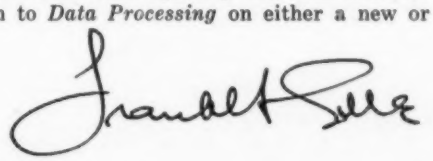
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We are pleased that we are now able to make the Annual available to *Data Processing Magazine* subscribers at one-half the regular price, when obtained in combination with a subscription to *Data Processing* on either a new or extended basis.



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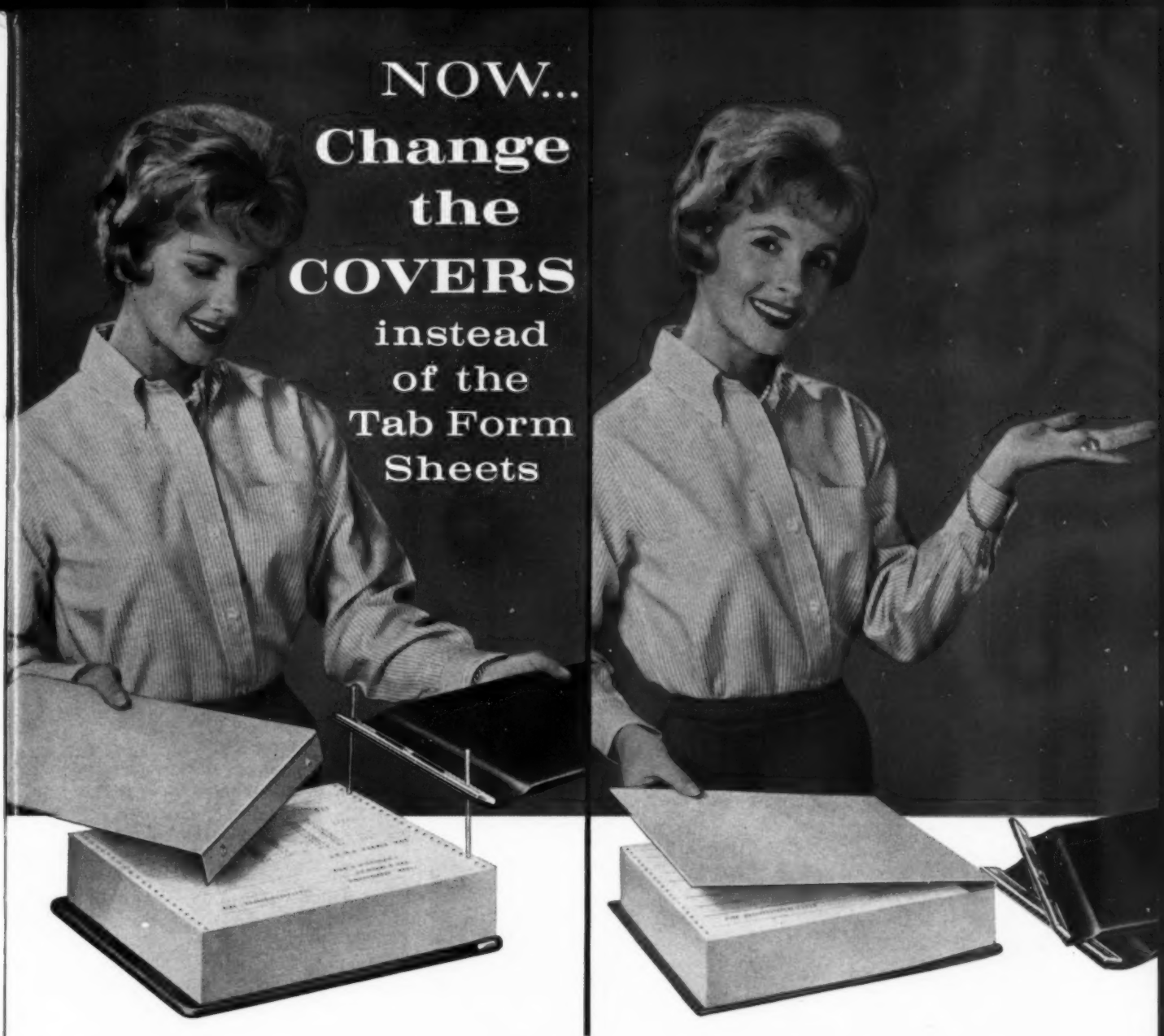
WILLIAM H. O'KEEFFE (*Step by Step*) is Division Industrial Engineer for American Steel Foundries, Elmes and King Division. He was responsible for installing an integrated inventory and production control system which encompasses all inventory and production transactions, planning, and reporting.

Mr. O'Keeffe holds degrees in Engineering and Business Administration from the University of Michigan. His background includes systems and procedures experience with IBM and management consulting. He first appeared in *DATA PROCESSING*, February 1960 issue, with "Material Coding for Data Processing."

**BANKING CONFERENCE**

The Second National Conference on Banking Automation will be held at the Detroit Leland Hotel on May 16-18. Again this is sponsored by the Detroit Research Institute, and information may be obtained from its director, Dr. Arvid W. Jacobson, at 12 East Hancock, Detroit 1, Michigan.

Among the topics discussed will be these, which have been most often requested: Theories of demand deposit computer processing, automatic transit for commercial banks, encoding problems, staffing the EDP section, audit control over computer processing, equipment selection studies, and the cost of computer processing.




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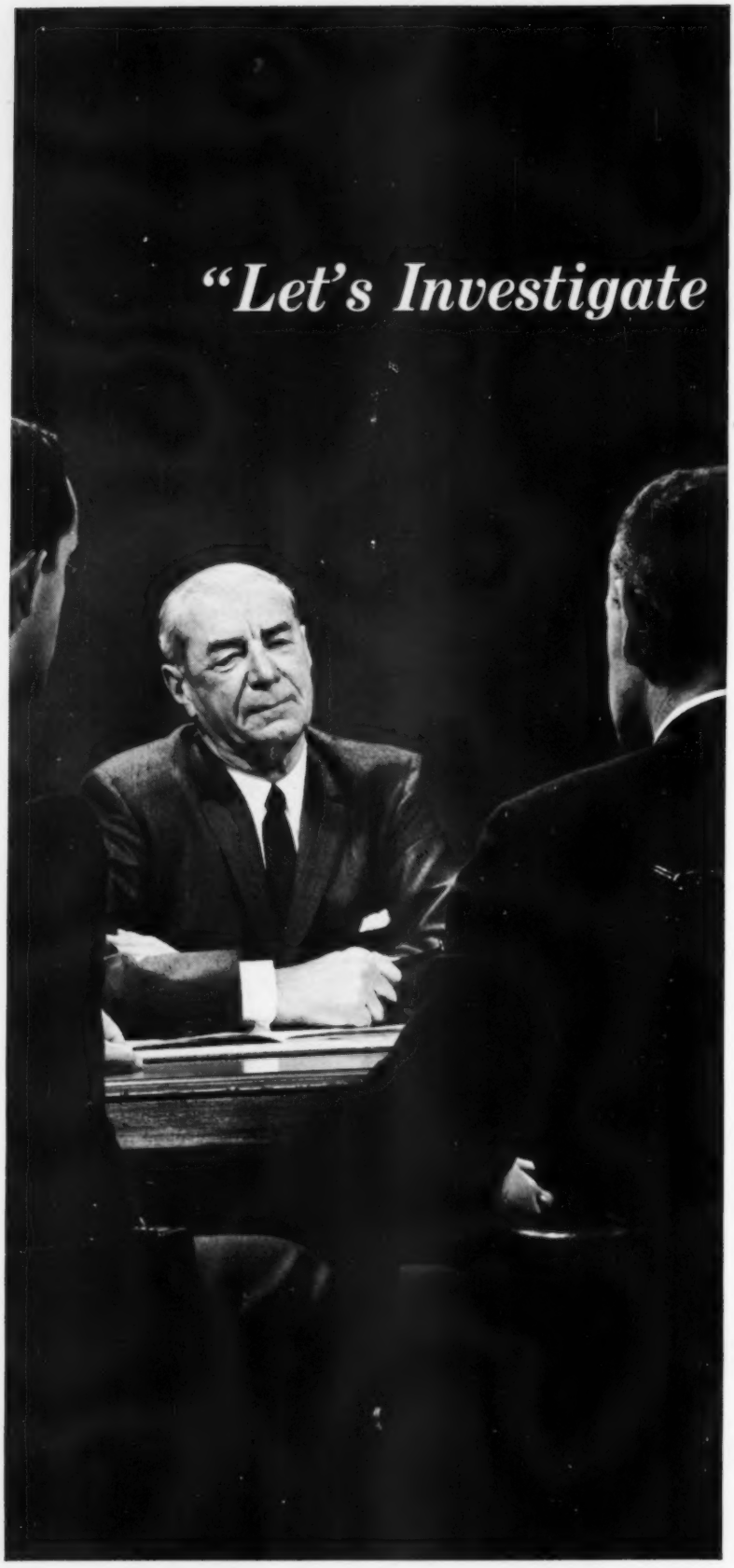
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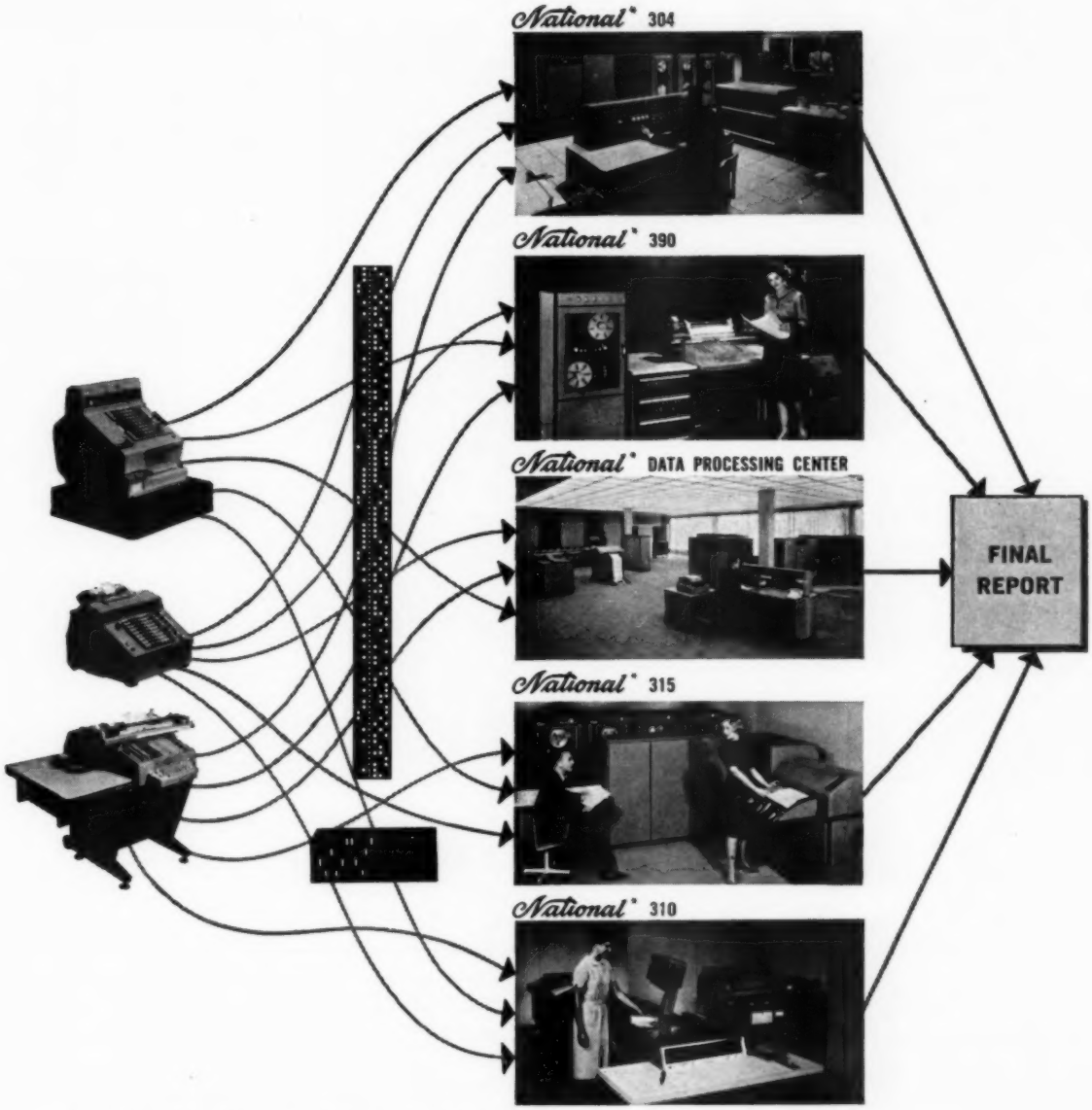
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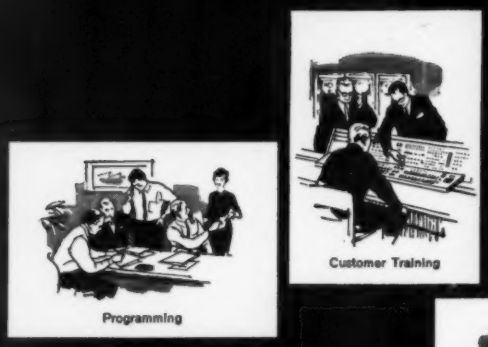

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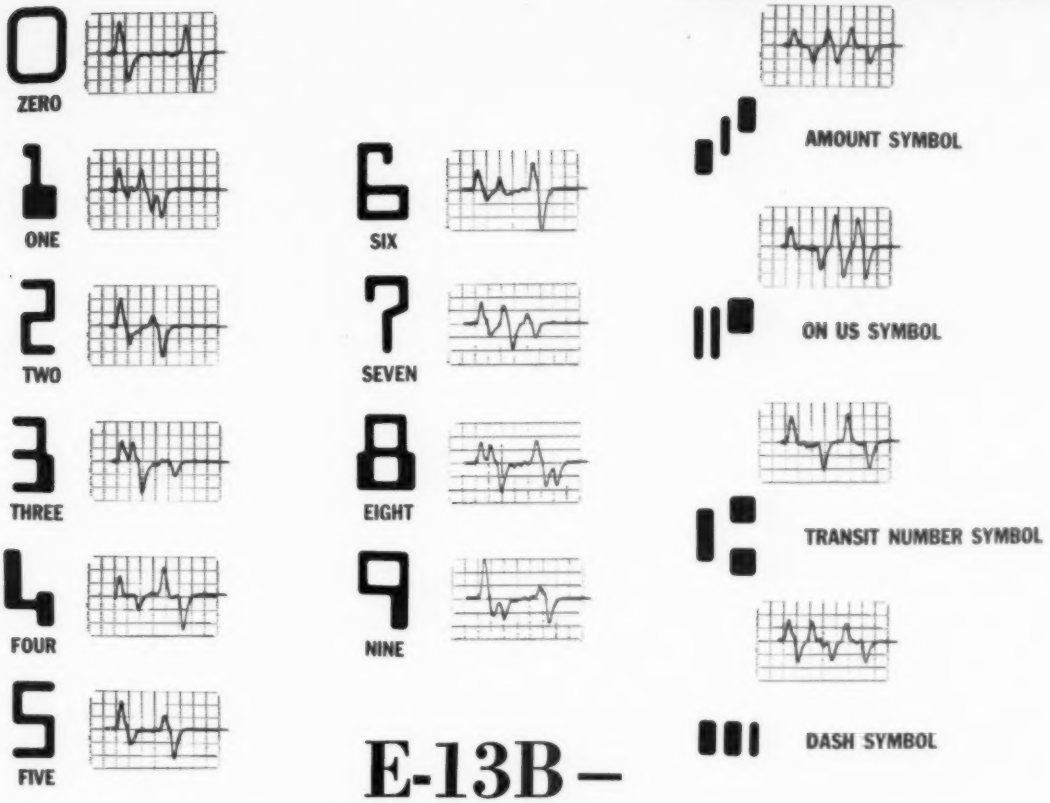
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COVER FEATURE




# E-13B — The Banks' Common Language

**Automation of banking is becoming a reality through the coding of documents in this new language.**

**By John H. DeJong**

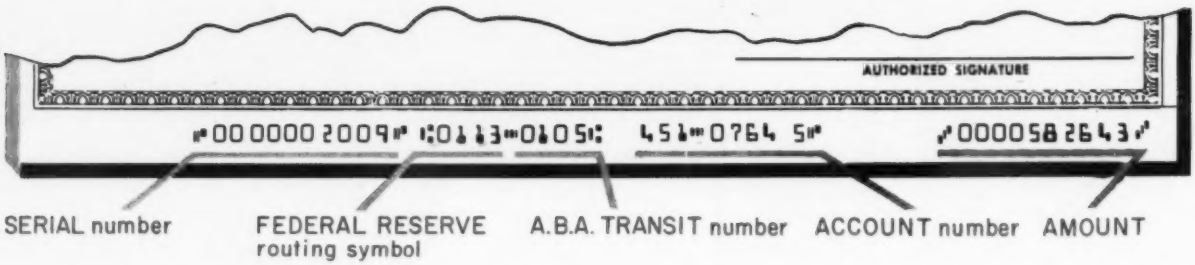
JUST TWO YEARS ago, in April, 1959, the American Bankers Association (A. B. A.) published the specifications for a machine language to be used in banking. This long-awaited release unlocked the door to the automation of the largest non-government paper handling application in the world—checks. Since then, banks throughout the country have been applying themselves to the task of opening that door and a few of them, at least, have a foot in the door.

Though still in its infancy, machine check handling has passed a number of major tests, and the next few years will show phenomenal growth in its use. Large banks are getting started; smaller banks are at least "taking a look"; whether they are interested or not, *all* banks may be *forced* into using this machine language in the next decade.

The language is known in general as MICR, for magnetic ink character recognition. The ink is not really magnetic; it contains iron oxide particles which are magnetized by machines handling the documents, and the magnetized fields are detected by magnetic reading heads. The A. B. A.'s choice of this kind of reading, rather than optical scanning, was due to the handling and over-stamping that checks normally receive; where optical reading is impossible, magnetic reading can still be accomplished so long as the over-stamping contains no magnetic material. Furthermore, the A. B. A. decision was based on the fact that very high speeds are possible magnetically; it is an electronic process, requiring very little mechanically.

### The language

The type font approved by the A. B. A. has the identification E-13B. The "E" series came after the A. B. A.'s rejection of fonts they called "A",




"B", "C", and "D"; the "13" refers to the 0.013 inch width of horizontal and vertical bars in the numerals. The "B" indicates that this is the second modification of the E-13 style. The terms "E-13B" and "MICR" are used interchangeably in reference to the common language for banks. There are fourteen characters in the type font — digits 0 through 9 and four control symbols.

As can be seen from the illustration, the characters resemble the digits they represent. The stylized numerals are necessary to create waveforms of a distinctive shape, both to allow recognition and to prevent incorrect identification. After the characters have been magnetized by passing them beneath a strong electromagnet, they are moved at a constant speed under a magnetic reading head. The waveforms thus created are tested to find which characters were read.

In one reading system, the waveform generated is retained in a nickel delay-line; the value of the signal is found at eight equally-spaced points and supplied to fourteen logic circuits, one circuit for each of the characters in the code. A strong output signal is emitted by the logic circuit corresponding to the particular character read. If two or more output signals of comparable strength are generated, the identification is not positive, and the character is rejected as unreadable. The probability of incorrectly identifying a character is very small; hence, reading accuracy is assured.

The figures in the illustration are, of course, considerably larger than those used on checks; the normal character-height is 0.117 inches or about ⅛ inch.

#### What goes where

To make these E-13B characters usable as a *common language* for bankers, the A. B. A. fully defined what magnetic ink printing was to appear on the checks, and in which places on the checks. A minimum of six inches was placed on check lengths, and the bottom ⅝ inch was reserved for MICR encoding; regular ink can appear in this ⅝ band, but magnetic ink in this area must be limited to the prescribed characters. Magnetic ink is permissible on any other part of the check. The E-13B characters are printed in a single line across the bottom of the check, ¼ inch above the lower edge.

This line of printing is divided into four fields: *Amount, On Us, Transit Number,* and *Auxiliary On Us.* The *Amount* field consists of ten digits bracketed by amount symbols; the field boundaries are ¼ inch and 1⅞ inches from the right edge of the check. The *On Us* field, used for account number and transaction codes, has 19 spaces which may be used or left blank; its boundaries are 1⅞ inches and 4¼ inches from the right edge. The *Transit Number* field consists of two four-digit numbers separated by a dash with a transit number symbol at each end. Note the similarity between the transit number and the routing symbol in the upper right corner of the check; boundaries for the transit number field are 4¼ inches and 5¾ inches from the right edge. The remainder of the printing line on the check is the *Auxiliary On Us* field, that is, everything but the right hand 5¾ inches. In checks of sufficient length this field can be used by the issuing bank for check numbering or whatever else it desires.

The coding of all but the amount field is normally done before the checks are issued. The amount is encoded by the first bank receiving the check for collection (that is, it will be so encoded when every bank begins to use the common language system). Every bank, regardless of its size, has been urged by the A. B. A. to begin printing its transit number on all checks. The Federal Reserve System will be able to effect great savings in clerical time because of this; to hasten the encoding, the Fed has been looking for ways to penalize non-conforming banks or to reward banks which have begun MICR encoding of transit number.

#### Printing problems

The biggest headaches in the MICR systems thus far have been in the printing of the E-13B characters. Too little or too much ink embossment, smearing, voids, skewed characters, or any one of a number of other printing problems can cause alteration of waveforms and rejection by machines reading the characters. It is impossible, of course, to expect that the printing will ever be perfect; the only question is how much imperfection is allowable. Roughly speaking, the tolerances allowed by the A. B. A. specifications are many times more stringent than tolerances in the average commercial printing applications.

As mentioned earlier, each bar in the code is 0.013 inch wide or multiple thereof; the latitude allowed in these widths is 0.0015 inch. To give some idea of what 0.0015 inch is, the paper on which *Data Processing* is printed is about 0.005 inch thick, or three times this allowable tolerance. A spot of extraneous ink much smaller than a period could cause an MICR document to be rejected. What does all this mean? In the past, good printing was determined by appearance only. Now a printer needs to have instruments to tell him whether his work is good or not. And several thousands of dollars are required to purchase the instruments necessary to insure a first class job.

The printing problems exist not only in the pre-qualifying of documents with transit number and account number, but also in the post-qualifying stage where amounts are encoded on the checks. Since the latter operation is *necessarily* done on the bank's premises, each bank using the common language *must* have facilities for testing the quality of its printing.

### Quality is improving

For a number of months, it looked as if the tight printing tolerances might prevent the success of the whole common language program. Commercial check printing companies were having batch after batch of test runs rejected and improvement was hard to see. Banks pioneering in the field found that they could expect failures in *every* batch of data.

But improvement did come, slowly but surely, until today it is practicable that banks do their *own* pre-printing of checks, a concept which was out of the question just a year ago. One can be quite certain that his documents will be readable if he exercises care in their preparation.

It is interesting to note that these printing problems are not caused by the magnetic qualities of the printing as much as by the particular code, E-13B. Those odd shaped waveforms would not be necessary in a system which uses binary "on-off" identification of its characters. Two such systems have been developed in Europe in the past few years.

### Other systems

A machine reading system known as Fred *(Figure Reading Electronic Device)*, designed in Great Britain, uses five vertical bars to identify a character. If over half of a bar is magnetically encoded, the bar is considered "on", otherwise it is "off". A simple logic circuit puts the five "ons" and "offs" together to determine which character was read. A stylized type font has been developed for Fred, in which the characters are just as readable by humans as the E-13B characters.

A French code, *caractère magnétique en bâtton-nets (C. M. B.)* differs from E-13B and Fred in that it does not rely upon the characters being of a special shape. Each character is formed by printing a sequence of seven vertical strokes; the outline of the character results from making these strokes of different lengths. The strokes are either 0.2 mm. or 0.4 mm. wide, and the spaces between them either 0.2 mm. or 0.4 mm. The combination of wide and narrow strokes determines the machine identification of the characters. A definite advantage of the C. M. B. code is that the shape of the printed characters is conventional and easily read by the human eye.

In both Fred and C. M. B., acceptable printing is much more easily attained than in E-13B. Quantity of magnetic ink makes no difference, and edge definition is less stringent. And the machines reading these codes do not require as extensive circuitry as that necessary to machine read the E-13B characters.

The principal interest in these other codes is in industries other than banking, since over a dozen countries have already decided that E-13B shall be used in their banks. Other applications may be found for Fred or C.M.B., either as magnetic characters or regular ink characters. (Replacement of the magnetic reading heads by photoelectric cells is about all that is required to read them optically.) Their advantage over the type fonts acceptable to current optical scanners is their binary construction, allowing simpler and less expensive machines to read them. Further, the C.M.B. code can be extended to include alphabetic and special characters, making it a practical and economical code for many optical scanning applications.

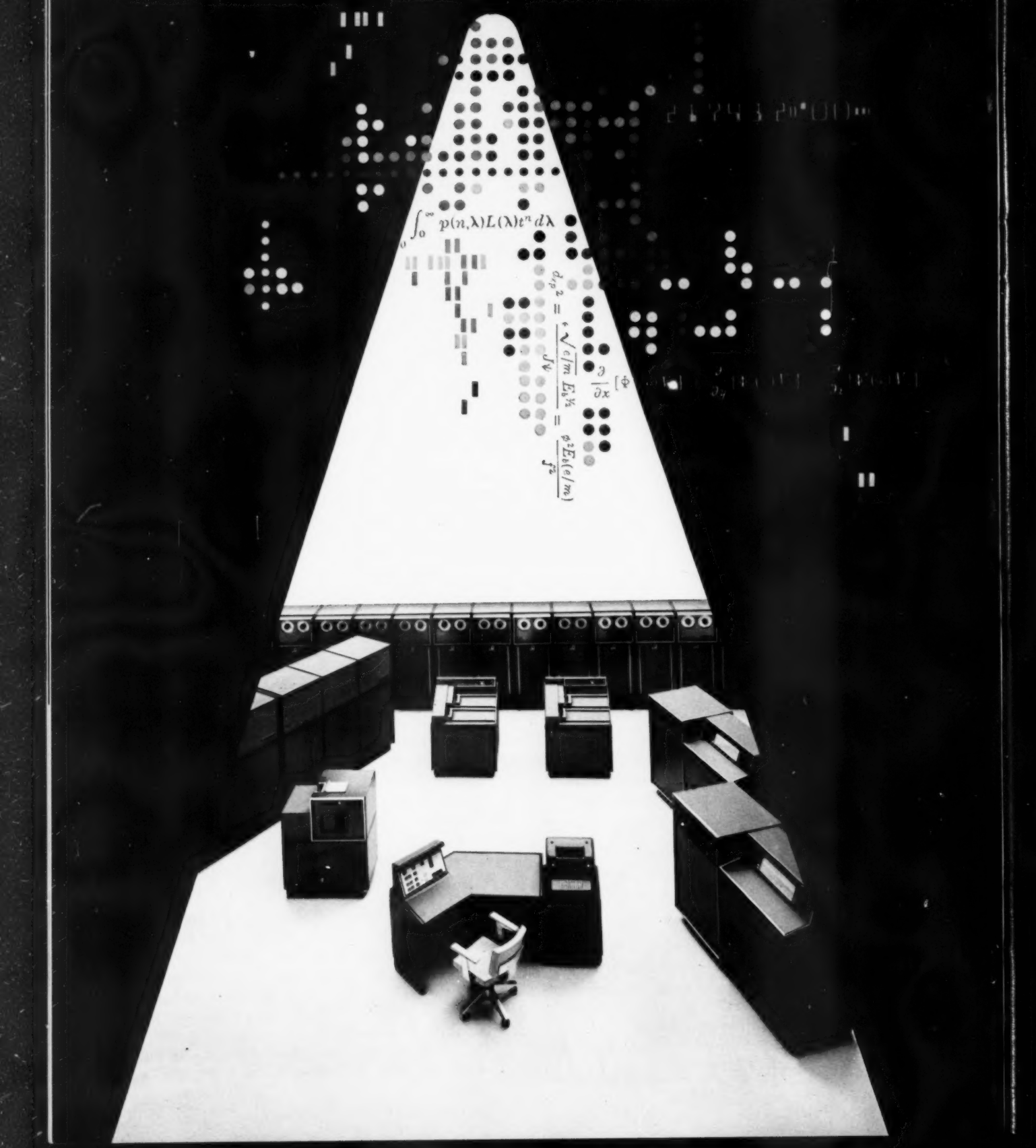
### Future of MICR

The future of MICR looks large, certainly, but will there be significant economies brought about by its use? Time alone will tell. What, then, is motivating the banking industry, a notably conservative group, to assume the expense of such a program? The *big* factor is *volume* of checks — it is expected to double in the next decade — and the bankers say that they could not possibly handle that many checks in their present systems. In addition, bankers wish to get in on automation and its advantages. As Mr. John Cost of the Fidelity-Philadelphia Trust Company put it in a recent speech:

> "Banks for the first time have a real opportunity to bring the level of their operations to a higher degree of efficiency, and to break the chains of tradition that have hampered them throughout the years. Banking cannot stand still while the rest of the world changes its habits. If banking as we know it is to survive, we must make our stand now or live to regret our lack of foresight and ingenuity."■

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# IN PROBLEM SOLVING & DATA PROCESSING

**The new Burroughs B 5000 Information Processing System is a decided departure from conventional computer concepts. It is a problem-oriented system. Its markedly different logic and language are in large part dictated by the characteristics of ALGOL and COBOL. And it incorporates a complete set of operating, monitoring and service routines.**

Additional operational features include an average add execution time of three microseconds, and a memory cycle time of six microseconds. Both character- and word-oriented, the B 5000 operates in binary *and* alphanumeric modes; a single set of arithmetic commands operates interchangeably on both fixed-point and floating-point numbers.

More important than these features is the fact that they combine with compiler-oriented logic and language to provide a new concept in computing—an integrated hardware-software system which sets:

## NEW STANDARDS OF PROGRAMMING EFFICIENCY

Incorporating logic and language designed to take advantage of modern compiler techniques, the B 5000 permits straightforward, efficient translation of common-language source programs. And it brings a new high in compilation speeds—20 to 50 times faster than those possible on conventional computer systems.

## NEW STANDARDS OF AUTOMATIC OPERATION

A Master Control Program, incorporating the automatic operating, monitoring and service routines, is pre-stored on a fast-access drum. It automatically schedules work according to pre-assigned priorities; allocates memory and input/output assignments; and maintains maximum-efficiency use of all components through a comprehensive interrupt system. As a result, human intervention is minimized, system efficiency maximized.

## NEW STANDARDS OF PROGRAM-INDEPENDENT MODULARITY

Availability of multiple, functionally independent modules provides the B 5000 with excellent system flexibility and expansibility. The system may include one or two independent processors; up to eight core memory modules with a total capacity of 32,768 48-bit words; and one or two fast-access bulk storage drums, each with a capacity of 32,768 words. Up to four independent input/output channels control a maximum of 26 input/output units, including up to 16 standard-format magnetic tape units. Additional input/output units include card punch and reader, two types of printer, plotter and keyboard.

## NEW STANDARDS OF EFFECTIVE MULTI- AND PARALLEL PROCESSING

The Program Independent Modularity of the B 5000, combined with the automatic scheduling and control features of the Master Control Program, permits multi-processing—the B 5000's normal mode of operation. The addition of a second functionally independent processor provides true parallel processing ability.

## NEW STANDARDS OF SYSTEM COMMUNICATION

The new B 5000 permits simultaneous on-line/off-line operation. It features completely flexible communication among all of its units. A central processor communicates with all memory units. Any input/output channel communicates with any peripheral equipment and any memory module.

## NEW STANDARDS OF THROUGH-PUT PER DOLLAR

All of these B 5000 features combine to provide an important new standard of through-put—the maximum amount of work in the shortest possible time, using the fewest possible components. The result is large-scale performance in the medium-price range.

For details in depth on the B 5000, call our nearby office. Or write for a copy of "The B 5000 Concept" to Data Processing Division, Burroughs Corporation, Detroit 32, Michigan.

Burroughs TM

**Burroughs Corporation**

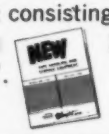
*"NEW DIMENSIONS / in electronics and data processing systems"*

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Division of Barry Wright Corporation, Worcester, Massachusetts

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APPLICATION OF THE MONTH



The Burroughs P 703 account and amount imprinter is designed for use in Michigan National Bank's electronic bookkeeping system to imprint magnetic ink characters, containing such information as the account number and amount if necessary on incoming checks, deposit tickets and other banking papers not previously encoded.

# Michigan National Bank

**Four major banking areas now entirely processed electronically.**

B 301 Magnetic Document Processing System makes it possible for Michigan National Bank to introduce information directly into the bank's electronic bookkeeping system from incoming checks, deposit tickets, installment loan coupons and other papers without additional preparation. Shown below are two sorters (left foreground and background); the control unit (center) and the electrostatic multi-printer (right) capable of printing at speeds equal to that of the sorter. For convenience the magnetic tape recording unit of the B 301 system is located in the computer room. The high-speed sorter seen in the background is used to fine-sort checks for return by mail to checking account customers.



**By Edith Harwith Goodman**

THE MICHIGAN NATIONAL BANK at Lansing has become a mecca for bankers seeking information on how a complete MICR *(magnetic ink character recognition)* system works, for Michigan National is the first midwestern bank with a fully automated electronic system for bank bookkeeping.

Across the street from Michigan's capitol building is the main office of Michigan National. And across the side street from the main bank is the black stone-and-glass Stoddard Tower, the bank's recently completed headquarters for their electronic data processing equipment which was designed and built for that department.

Michigan National is the fiftieth largest bank in the country, and the state's fourth largest. The main office at Lansing is the central data processing headquarters; the branches in eight central Michigan cities send their documents to the center by courier car at closing time daily and receive processed data and documents before opening time the following morning. The bank has 287,000 checking and savings accounts and 137,000 borrowers. Just handling checking items creates a pile of paperwork of about 57 million items a year *(an increase for 1960 of 12 million over the previous year)*. Since each check must be handled manually at least half a dozen times before it is

returned to the issuer, this makes tremendous amounts of paper to handle, in addition to which there are deposit slips and other items.

Michigan National had studied the problem of how to hasten and ease paperwork processing for several years before a determination to install an electronic data processing system was made.

When the American Bankers Association finally adopted the MICR common language in the form of E 13B, Michigan National Bank began educating its customers in the use of the magnetic ink character encoded checks and deposit slips. The program took many months and cost about a half million dollars. There was a concurrent program of check testing for customers of the bank who have their commercial checks made up by their own printing houses. This meant running thousands of these checks through the reader-sorters to see if the close tolerances specified by ABA and machine requirements were followed and if the machines could read the magnetic printing.



The press visits the computer room for a view of the B 220 at work.

### General checking system

When a customer opens a checking account he is issued a supply of MICR encoded checks and deposit slips. These have both the bank's number and the customer's own account number on them.

The bank number is the first group of numbers on the left at the bottom of the check enclosed in symbols identifying it as such. This is for clearing house purposes and identifies the bank's address by city and Federal Reserve zone. The central group of figures—within their own symbol—is the internal bank number which identifiies the customer account number.

These coded fields and symbols have the same format for all the checks drawn on all banks in the country; smaller banks are encoding their checks although they may not be using electronic sorting for a long time to come. This is for clearing purposes as the check travels on its way back to its own bank.

The amount of the check is encoded in magnetic ink at the first bank to handle the check after it is drawn, the only magnetic ink information which has not been preprinted. Now the check is ready for electronic processing.

### How Michigan National does it

As checks are received at the branches they are proofed and the amount is encoded as part of the proof process in magnetic ink on each check in the lower right hand section reserved for that purpose. The batch proof ticket is also printed in magnetic ink; this shows the amount for checks in that batch. At the day's end these checks and other docu-



ments are taken by courier to the central data processing department at Lansing.

There the documents are taken into the first of three rooms containing the electronic machines. The first stop is in the room containing the Burroughs B 301 system: two B 101 sorter-readers, an S 801 electrostatic multi-printer, and the B 301 control unit *(a solid state computer having a central control panel, magnetic core memory of 30 words — 11 five-bit numeric digit words and a special five-bit sign, arithmetic unit, logic and control circuitry and plugboard programming)*.

The documents are put on the sorter-readers in random batches. As each batch is sorted the amount of the batch ticket is read and stored. As each check is read its amount is subtracted from the stored total; the account number is verified and the bank number is checked for correctness. As each item is proven correct the information, account number, and amount is printed by the S 801 on four separate paper tapes for visual editing. One tape contains a list of all the checks, another shows unidentified checks, another the exceptions for special handling, and the fourth all the checks which are drawn on Michigan National. As the electrostatic printer writes the visual record the B 301 system converts the same information for simultaneous writing of magnetic tapes for computer use.

The amount of each check is subtracted from the batch total and the difference is noted on the printed tape for visual checking.



The visiting editors watch the speed printer turn out statements and other printed documents.

The magnetic tape containing the check and deposit information is taken into the second room to be read into the Burroughs 220 computers. The checks remain in the sorters for fine sorting of checks and deposit tickets into account numbers. *(These are the checks drawn on the bank; those not "on us" are routed elsewhere.)*

The data read into the computer is again balanced, the checks and deposit information is sorted by the computer into account number sequence, and the posting begun. The account numbers on the checks and deposits are used to locate the customer's record and the amounts either added or subtracted by the computer.

During the posting operation, journals, reports and statements are automatically prepared and transferred to another magnetic tape. This last output tape is removed from the second room and taken to the third room which houses two tape units and a Burroughs high speed printer, which operate off-line. Here a printout is made of the necessary reports, journals, and statements.

The checks, which are now in account number sequence, and statements, also in account number sequence for each branch bank, together with the journals and reports, are returned by courier car to the proper local office where the customer's signature is used to verify his checks. Upon signature verification the checks are placed in the customer's file. Those checks for customers due for statements are removed from the file and returned to the customer along with a statement.

**Four areas programmed**

Michigan National now has four major account or bookkeeping functions processed electronically, either through MICR or punched paper tape as starter input. These four are: checking *(special, personal and commercial checking accounts alike)*, saving, mortgage, and loans. Commercial and installment loan applications use MICR checks, deposit tickets, and payment coupons *(the bank is able to use 51 column cards or smaller coupons by enclosing them in special enclosure envelopes so they can be carried through the sorters, which are not made for such small items)*. New account or new loan information or any record changes are punched into paper tape and read into the computer. Both new account information and deposit or withdrawal and payment data for mortgage and savings applications are punched into paper tape for conversion to magnetic tape for computer processing.

The data processing staff of Michigan National plans to install all possible banking information and bookkeeping functions into the electronic system as soon as possible. ■

Dreyfack on PERSONNEL —A Monthly Feature

# If At First You Don't Succeed . . . Simmer Down!



RAYMOND DREYFACK

*"Boy, if there's one thing that gripes me . . ."*

HOW MANY TIMES have you heard those words used in your department or installation? How many times have you said them yourself?

It's not so much the saying that's important, but the tension behind it. To many of us anger is Private Enemy No. 1. Yet how many of us actively and aggressively combat it?

It's an interesting thought to explore. The consequences of anger may be devastating if you don't keep it under control.

For an example let's take a look at one supervisor who unwittingly permitted himself to be victimized by the old snorting dragon.

Tom Collins! Let's call him that, because he usually needs a drink to cool off.

Tom has his problems. Well, who hasn't? Trouble with Tom is that he lets the problems get under his skin. Wouldn't be so bad if he let them loose once in a while. But not Tom; he keeps them all bottled up inside like an overfilled balloon ready to pop.

One of Tom's problems is Susie E. Blabbermouth — E for endless. The company's leading "yak" artist, and she had to be in his department. With the order backlog Tom's big need is work, work, work. Susie's specialty is talk, talk, talk.

So Tom burns.

Anger is a funny thing. It has a strong and definite physiological effect on the body. Anger is a powerful master pull-cord which controls a lot of lesser strings attached to it.

When you get angry—*inwardly or outwardly*—you're yanking away at that master control cord. That tightens up all the lesser strings attached to it.

It tightens your muscles, your chords and your blood vessels.

It's like wiring in a single shot to emit impulses all over your plugboard, a kind of chain reaction.

We're all constituted differently. Depending on which strings of our body tighten as a result of getting angry different things will happen.

We can get headaches, develop high blood pressure, gastric disorders, ulcers. If the blood vessel leading to the heart should happen to be squeezed too hard by inward rage—rots 'o ruck!

Friend Tom Collins happened to be the ulcer type of madcap. In addition to Susie he had a whole list of gripes, some valid, some ridiculous. Machine trouble, for example. This really could set him off. Now let's face it. You can kick a machine, or cuss at it all you want. But who's going to win the argument?

Then there's the deadbeat in the sales department who always holds up the orders. And Pete Smith. Pete was Tom's favorite gripe — strictly the inward variety.

Tom could sit and burn for hours over Pete Smith. All because Pete, who worked in general office, made more money than he did, and, in Tom's estimation, had half his brains, and did about a sixth as much work.

A good deal of us have "Petes" in our backgrounds — and those of us who brood about it are asking for a one way passport to Ulcerville.

Maybe Tom Collins is an extreme case, but Cub's honor, he's no rare exception. And the data processing department seems to be as popular a habitat as any for this kind of critter.

The guy who habitually allows his anger to ride herd over him is asking for trouble. This doesn't mean we can sit down, evaluate our gripes like some super-analyst, and casually toss them down the drain.

In fact, if you're the kind who *never* gets angry, according to the head shrinkers, you have even worse problems than Tom, and you'd better pinch yourself every so often just to make sure.

### What we can do

The purpose of this harrangue isn't to create the fantastic impression that any of us could or should lead lives *devoid* of anger. What we must put our minds to, however, is the knack of bossing this emotion before it starts holding a whip over us.

When do we know we have the upper hand over anger?

There are several ways to determine this. First, if we get angry too often it's a bad sign. If we get angry about petty things, that's no good either. The worst sign is if we constantly burn inside without ever releasing our anger.

Now, this doesn't mean we should blow off steam by punching our boss in the nose, or tossing Susie out on her — er, ear. Whatever positive effects th[illegible] sometimes practical-sounding [illegible]ggestions might have would be compensated by other problems such as getting fired or thrown in the can.

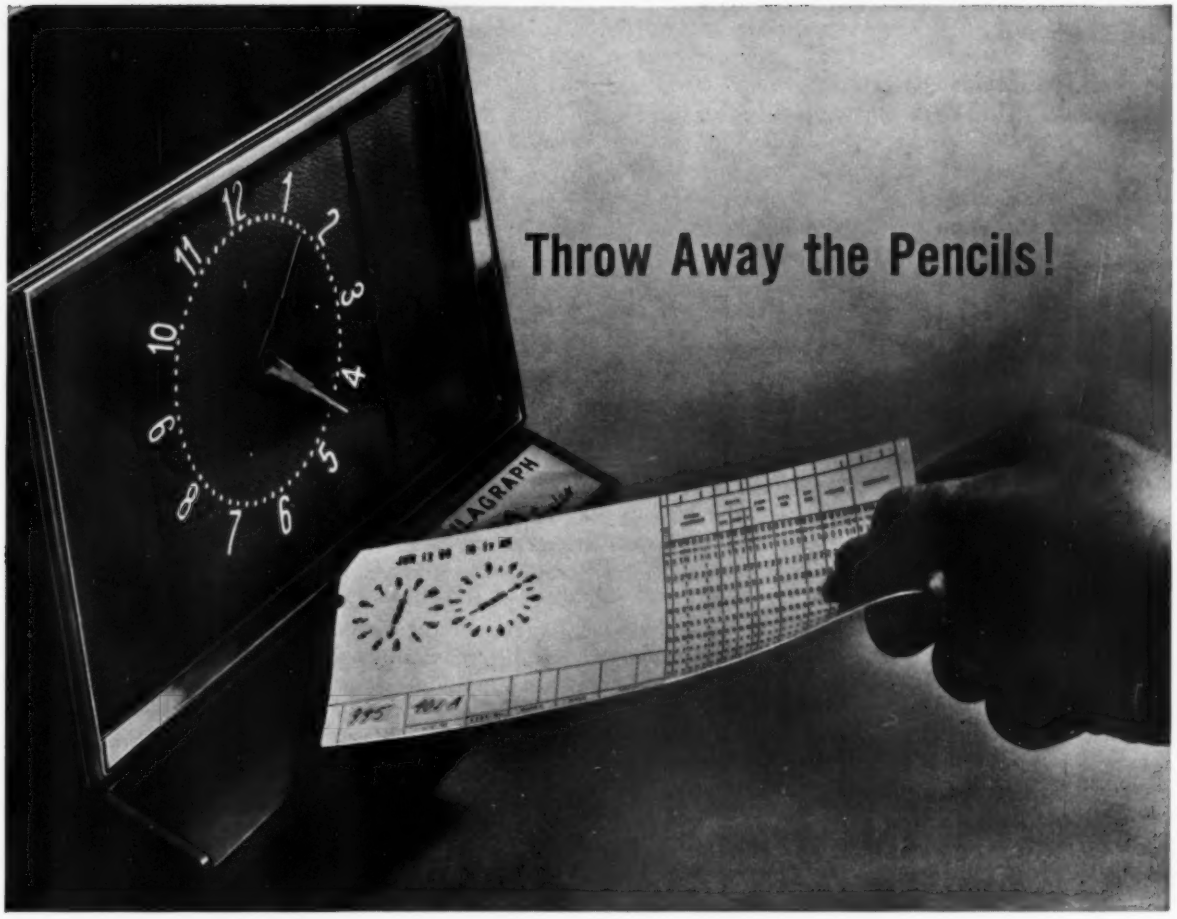
There are, however, definite positive and sensible actions that should be taken. One is talking. Two is walking. Three is work. Let's use these for a starter.

If you have a gripe that is getting your spirits down and your dander up, talk it over with someone—your boss, your wife, your best friend. Sometimes even, your worst enemy.

Remedy number two. Many a gripe has been aired and dismissed by a good brisk walk. And, of course, hard work is a gripe dispeller of long-standing value.

There are other methods too. Hobbies help balance anger pressures with relaxation and fun. Then there's always the fine art of examining the other fellow's viewpoint. Maybe that deep-seated muscle-

*(continued on page 41)*




# Calculagraph 500 Series automatically computes actual labor time — eliminates error-ridden manual methods.

Your data collection system can be greatly simplified and attain greater accuracy with the new 500 Series Calculagraph because this completely new computing time recorder, based on the time-tested Calculagraph principle, computes as well as prints the actual time worked on any given production job. There are no complicated levers or buttons to set. The 500 Series makes the decisions. Production workers merely insert job cards at the "start" and "finish" of the job. The 500 Series does the rest. The actual time worked, with nonworking periods automatically deducted, is printed on the job card and ready for processing.

The 500 Series dovetails easily with any internal data processing system or outside service center. In smaller systems where the volume does not justify the use of machine accounting, this new computing time recorder can be a system in itself.

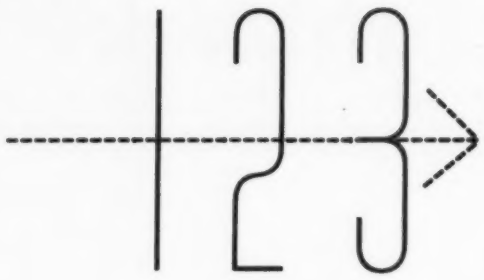
Investigate this new 500 Series now. Write or call for more details and, if possible, send us samples of your job cards for analysis.

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INDUSTRIAL DIVISION

**CALCULAGRAPH Company**

**275 Ridgedale Avenue, Hanover, New Jersey**



# Step by Step

**Much preliminary work assures smooth conversion.**

**By William H. O'Keeffe**

ENVY THE SMALL ONE-MAN BUSINESS; how easy it is for the owner to conceive and install new procedures. The introduction of a partner means that a second person is to be consulted in any intended changes, a second individual with different ideas, experiences and intentions. While change must come, it is increasingly complicated to effect as the number of personalities increases.

One change which industry is accepting today is the use of electronic and electro-mechanical devices to absorb the increasing burden of paperwork. Data processing equipment is being challenged to assume more of the routine clerical duties of business operation. The greater the number of clerical duties that can be defined by punched holes, tubes, diodes, relays and wiring, the greater will be the acceptance by industry for this type of equipment.

While management may want the advantages of accelerated processing of data and the preparation of summary reports for their analysis, there is more to satisfying their desires than ordering equipment and translating routine clerical duties into a series of symbols that will be comprehensible to the equipment. What great demand would there be for him who had but to snap his fingers or rub the magic lamp to install the new equipment and procedures. Fortunately for many of us, *he* is not available.

These are the steps that we went through to install an IBM Ramac 305 at the Elmes and King Division of American Steel Foundries. The system was conceived and installed under our vice president, and was to include inventory and production control fuctions.

The main requisite for any system installation is management's backing, for without this it would be impossible. It is not possible to conduct even a rough survey of the potential of a system without management's willingness to turn you loose for the necessary period of time. When we receive the nod to proceed, we look for these items: What will it do that is not possible now? How much will it save? What additional controls will management receive? etc.

At the end of the application survey it is time to sell management again. This time on the proposed system. The applications to be included in the initial installation should be adequately defined to permit details of advantages, costs and expected benefits, and approximation of time necessary to complete installation. In the proposal stage it is unlikely that the detailed conversion plans are prepared, for it is better to wait until management has accepted the program and is ready to give full support to the installation.

### Planning

The selection of the project director will be influenced by the nature of the installation and the availability of talent within the organization, or the desire to use the installation for development of management potential. Primary is the confidence of management in the individual entrusted to oversee the installation from conception to completion. As a working position, the project director should have no duties other than those of making the installation.

The first responsibility of the project director will be preparation of the conversion plans. While he will not do all the work, it is his responsibility to survey the present and proposed procedures to

determine specifically what must be accomplished. This requires much work and an assistant is desirable.

To start the plan it is wise to have a sheet of paper for each department in the organization. On this should be listed every conceivable item or subject required or affected by the change, regardless of the extent to which the department will be affected by changing that item. As long as there is the slightest relation of the change to a department, the sheet for that department should show the item. This is largely a brainstorming approach; refinements will come later.

After listing it is time to sift. Related items should be brought together and a common definition set down for each item or step. Steps thus established will be the key to the installation from now on and should be sufficient to include all of the major aspects of the proposed installation. Some of the overlooked minor aspects will be picked up in the definition of the step as things progress. The important point at this phase of the plan is to include all that is possible without missing the main points or developing so many steps that it will be impossible to keep track of them.

Now the data is ready for developing the conversion or installation schedule and assigning responsibility for each step.

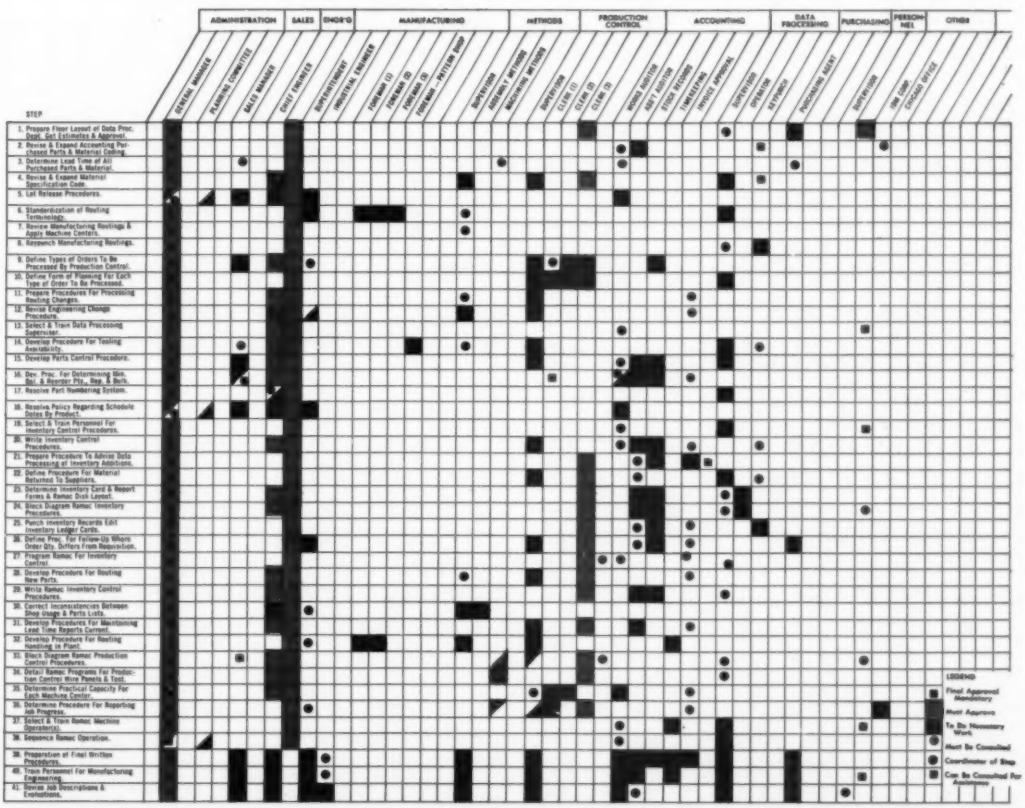
### Cooperation and understanding

Success will depend on the understanding and willing support of those who are to maintain and use the system; it is very important to utilize their talents in developing the system. In addition to their many years of experience and know-how, the psychological advantage in their participation is tremendous.

The project director may fade from the picture eventually, leaving the system to other employees. The better understanding they have of the system and the more they feel it is theirs from active participation in development, the more successful will be the installation. Too often a procedure is rammed down their throats, creating animosity and misunderstanding that causes trouble for even the most carefully developed system.

To gain further support of the operating departments, the department heads should be called together to resolve the schedule and responsibility for the completion of each of the conversion steps. Without regard to the sequence in which the steps are to be taken, each of the steps and what they include should be discussed in detail with the department heads. All that is necessary at this point is to reach unanimity. Points which have been overlooked should be incorporated into the list of steps. Vague or incomplete definitions should be cor-

**EXHIBIT I RESPONSIBILITY CHART**



## EXHIBIT II MASTER SCHEDULE AND PROGRESS CHART

| STEP | SCHEDULE: MARCH | APRIL | MAY | JUNE | JULY | AUGUST | PERCENT COMPLETION AT REVIEW PERIOD: 3/23 | 4/6 | 4/20 | 5/11 | 5/25 | 6/8 | 6/22 | 7/13 | 7/27 | 8/10 | 8/24 | FOLLOW UP? YES - NO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Prepare Floor Layout of Data Proc. Dept. Get Estimates & Approval. | | | | | | | 90 | 95 | 95 | 95 | | | | | | | | |
| 2. Revise & Expand Accounting Purchased Parts & Material Coding. | | | | | | | 60 | 95 | 100 | | | | | | | | | |
| 3. Determine Lead Time of All Purchased Parts & Material. | | | | | | | 50 | 90 | 95 | 100 | | | | | | | | YES |
| 4. Revise & Expand Material Specification Code. | | | | | | | 65 | 75 | 90 | 100 | | | | | | | | |
| 5. Lot Release Procedures. | | | | | | | 10 | 75 | 100 | | | | | | | | | |
| 6. Standardization of Routing Terminology. | | | | | | | 100 | | | | | | | | | | | |
| 7. Review Manufacturing Routings & Apply Machine Centers. | | | | | | | 12 | 17 | 25 | 35 | | | | | | | | |
| 8. Keypunch Manufacturing Routings. | | | | | | | 6 | 17 | 19 | 31 | | | | | | | | |
| 9. Define Types of Orders To Be Processed By Production Control. | | | | | | | 90 | 100 | | | | | | | | | | |
| 10. Define Form of Planning For Each Type of Order To Be Processed. | | | | | | | 10 | 50 | 90 | 90 | | | | | | | | |

## EXHIBIT III INSTALLATION RESPONSIBILITY ESTIMATE (hours)

| STEP | ADMINISTRATION: GENERAL MANAGER | PLANNING COMMITTEE | SALES MANAGER | SALES: CHIEF ENGINEER | ENGR'G: SUPERINTENDENT | ENGR'G: INDUSTRIAL ENGINEER | MANUFACTURING: FOREMAN (1) | FOREMAN (2) | FOREMAN (3) | FOREMAN - PATTERN SHOP | ALL FOREMEN | SUPERVISION | ASSEMBLY METHODS | MACHINING METHODS | METHODS: SUPERVISOR | CLERK (1) | CLERK (2) | CLERK (3) | PRODUCTION CONTROL: SENIOR JUNIOR | JUNIOR ACCOUNTANT | STOCK RECORDS | TIMEKEEPING | INVOICE APPROVAL | ACCOUNTING: SUPERVISOR | OPERATOR | KEYPUNCH | DATA PROCESSING: PURCHASING AGENT | PURCHASING: SUPERVISOR | PERSONNEL: IBM CORP. | OTHER: CHICAGO OFFICE | IBM CORP. | TOTALS | TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Prepare Floor Layout of Data Proc. Dept. Get Estimates & Approval. | 1 | | 1 | 1 | 1 | 9 | | | | | | | | | | | | | 4 | | | | | 16 | | | 8 | | | | | 41 | |
| 2. Revise & Expand Accounting Purchased Parts & Material Coding. | 1 | | | | | 1 | | | | | | | | | | | | | 16 | | | | | 6 | | | 2 | | | | | 26 | |
| 3. Determine Lead Time of All Purchased Parts & Material. | 1 | | | 2 | | 1 | | | | | | | | | 2 | | | | | | | | | 4 | | | 4 | | | | | 10 | |
| 4. Revise & Expand Material Specification Code. | 1 | | | 24 | 1 | 1 | | | | | | 5 | | | 5 | | | | | | | | | 4 | | | 3 | | | | | 44 | |
| 5. Lot Release Procedures. | 20 | | 20 | 20 | 20 | 4 | | | | | | | | | | | | | 20 | | | | | | | | | | | | | 104 | |
| 6. Standardization of Routing Terminology. | 1 | | | | 4 | 1 | 4 | 4 | 4 | | | 40 | | | | | | | | | | | | 4 | | | | | | | | 62 | |
| 7. Review Manufacturing Routings & Apply Machine Centers. | 1 | | | | 1 | 1 | | | | | | | | 63 | | | | | | | | | | | | | | | | | | 65 | |
| 8. Keypunch Manufacturing Routings. | 1 | | | | 1 | 20 | | | | | | | | | | | | | | | | | | 40 | 1,120 | | | | | | | 1,182 | |
| 9. Define Types of Orders To Be Processed By Production Control. | 1 | | 1 | | 1 | 1 | | | | | | | | | 7 | | | | | | | | | | | | | | | | | 11 | |
| 10. Define Form of Planning For Each Type of Order To Be Processed. | 10 | | | | 8 | 40 | 2 | 2 | 2 | | | | | | 60 | | | | | | | | | 40 | | | | | | | | 104 | |
| 11. Prepare Procedures For Processing Routing Changes. | 1 | | | | 1 | 6 | | | | | | 10 | | | 10 | | | | | | | | | 10 | | | | | | | | 38 | |
| 12. Revise Engineering Change Procedure. | 1 | | | 2 | 1 | 6 | | | | | | 5 | | | 10 | | | | | | | | | 10 | | | | | | | | 35 | |
| 13. Select & Train Data Processing Supervisor. | 1 | | | | | 1 | | | | | | | | | | | | | 68 | | | | | | | | | | | | | 70 | |
| 14. [illegible] | | | | 1 | 4 | 10 | | | | | | | | | | | | | | | | | | | | | 3 | | | | | 119 | |
| [illegible] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 240 | |
| 37. Program Ramac For Inventory Control | 4 | | | | | | | | | | | | | | | | | | | | | | | 40 | | | | | | | | | |
| 38. Develop Procedure For Routing New Parts. | 1 | | | | | | | | | | | 5 | | | 5 | | | | 4 | | | | | 5 | | | | | | | | | |
| 39. Write Ramac Inventory Control Procedures. | 1 | | | | 1 | 8 | | | | | | | | | | | | | 40 | | | | | 20 | | | | | | | | 70 | |
| 40. Correct Inconsistencies Between Shop Usage & Parts Lists. | 1 | | | 1 | 8 | 1 | | | | | | 140 | | | 4 | | | | | | | | | 1 | | | 1 | | | | | 175 | |
| 41. Develop Procedures For Maintaining Lead Time Reports Current. | 1 | | | | 1 | 1 | | | | | | | | | | | | | 4 | | | | | 1 | | | | | | | | 9 | |
| 42. Develop Procedure For Routing Handling In Plant. | 1 | | | | 8 | 2 | | | | | | 2 | | | 10 | | | | 12 | | | | | 2 | | | | | | | | 35 | |
| 43. Block Diagram Ramac Production Control Procedures. | 4 | | | | 40 | 20 | | | | | | | | | 24 | 80 | | | 16 | | | | | 168 | | | | | 40 | | | 316 | |
| 44. Detail Ramac Programs For Production Control Wire Panels & Test. | 4 | | | | 4 | 20 | | | | | | | | | 10 | | | | 20 | | | | | 60 | | | | | 80 | | | 278 | |
| 45. Determine Practical Capacity For Each Machine Center. | 1 | | | | 1 | 4 | | | | | | | | | 20 | | | | 2 | | | | | 6 | | | | | | | | 34 | |
| 46. Determine Procedure For Reporting Job Progress. | 1 | | | | 4 | 2 | | | | | | | | | 10 | | | | 4 | | | | | | | | | | | | | 21 | |
| 47. Select & Train Ramac Machine Operator(s). | 1 | | | | | 1 | | | | | | | | | | | | | 1 | | | | | 160 | | | | | | | | 163 | |
| 48. Sequence Ramac Operation. | 4 | | 4 | 4 | 4 | 4 | | | | | | | | | | | | | 12 | | | | | 8 | | | | | | | | 40 | |
| 49. Preparation of Final Written Procedures. | 20 | | 8 | 8 | 20 | 28 | | | | | | 20 | | | 60 | | | | 80 | | | | | 20 | | | 8 | | | | | 244 | |
| 50. Train Personnel For Manufacturing Engineering. | 20 | | 20 | 20 | 20 | 80 | | | | | 108 | | 20 | 30 | 80 | | | | 20 | 20 | 80 | 40 | 20 | 80 | 40 | 80 | 40 | | 80 | | | | 1,004 | |
| 51. Revise Job Descriptions & Evaluations. | 1 | | 1 | 1 | 8 | 4 | | | | | | 1 | | | 5 | | | | 5 | 40 | | | | 8 | | | 1 | | 40 | | | 267 | |
| TOTALS | 123 | | 187 | 87 | 187 | 459 | 6 | 6 | 6 | 10 | 108 | 448 | 180 | 710 | 446 | 80 | | | 728 | 140 | 784 | 40 | 20 | 968 | 120 | 1,580 | 77 | | 120 | 680 | | | 5,314 | |

rected. Remember, the project director is not to make the installation but rather he is to guide and assist those who will.

After reaching an understanding of what will be required, the group should begin to assign responsibility for each step. Determine which individual or individuals will have the responsibility for approval of each completed step, which individual is to oversee each step, who is to expend the necessary effort to complete each step, and who will assist. The patterns for assigning and distributing the responsibility and work load are as varied as company organizations. Each company will thus develop its own master plan. The more extensive the initial applications, the greater the need to reach higher in the organization chart for participating management. Policy affecting one department can be resolved by that department head, whereas policy affecting more than one department will require both department heads and their mutual superior. In a major installation it is unlikely that policy will not be influenced.

### Responsibility

A responsibility chart which our organization developed is shown in **Exhibit I.** In the vertical column at the left each step is listed, not necessarily in sequence. Across the top of the chart, by department, are listed the individuals who were to have some responsibility. Under each name a color coding system was used to depict his responsibility for the appropriate step. The chart was prepared before the organization meeting, reviewed and discussed during this meeting; the final chart which was subsequently prepared incorporated the group decisions.

Between the initial organization meeting and the

second meeting, each department supervisor was given the opportunity to examine his assignment and to formulate when and how the work was to be accomplished. The second organization meeting was held to construct the detailed conversion schedule. Using the same basic chart, the responsibility color code was substituted by an estimate of the required work time for each individual for each step. This not only evaluated the work load for each individual but showed the magnitude of work and estimated cost of each step, and the accumulated estimate of work for the entire project.

As each supervisor analyzed his expected work load it was a relatively simple matter to plan a budget of time for himself and his staff to arrive at a reasonable schedule. Consideration was given to the completion of preliminary steps to arrive at the over-all conversion schedule. It is important to develop a realistic schedule that can be maintained by properly balancing regular daily duties and the additional work required by the pending installation. The estimated time can indicate need for additional temporary help. A chart summarizing the estimated time for each step and each individual is shown in **Exhibit III.**

At the conclusion of the second meeting each man knew both what was required of him and his time schedule. Each step was made the responsibility of one individual who was to coordinate the efforts in the performance of that step.

Each department head was provided a copy of the installation manual which included all of the organizational planning for the installation. The manual contained definitions to serve as a guide in satisfying the detail and over-all conversion, for each department, and discussion of each step with which the department had been assigned some responsibility. The discussion listed the step coordinator, assigned crew, approval authority at the completion of the step, a brief description of the step content and the estimated completion date for that step. Each manual contained copies of the responsibility chart and the installation schedule **(Exhibit II).**

### Conversion progress

The organizational planning for the installation should provide for periodic review and assessment of current progress. Without planned period review, installation progress will diminish and, if left for a long enough time, will come to a stop. Determine at the outset that regular meetings will be held to determine current status of all work. Unforeseen problems which arise can readily be settled during these progress meetings.

The magnitude of the installation and the extent of departure from existing procedures will be primary factors in determining the frequency of progress meetings. They are essential to the completion of the installation and must not be avoided or held so infrequently that control over progress is lost. On the other hand, too many meetings become a drudgery and reduce morale and effectiveness. At the start, progress meetings should be held at two week intervals; when most of the work is completed they may be held once a month.

Smoothly run progress meetings can improve effectiveness. Advance planning, with each step coordinator completing a short status report on his progress to date and forwarding this report to the project director in advance, greatly reduces the time and detail of progress meetings. The progress made should be posted against the previously developed conversion schedule to permit assessment of actual and planned work. The project director can thus expedite the meeting by presenting the current picture and verbally discussing the status reports submitted. As each step is completed it is eliminated from reports, and the progress meetings will be proportionally shortened.

Despite the discomfort of adding this work to the daily duties, the job must be done and it must be done properly. The teamwork developed throughout the installation will carry over and result in more effective operation.

### Personnel training

The third and final phase of the installation is no less important than the earlier phases. Athough it continues long after the completion of the other phases, the training will regulate the success of the installation. Throughout the conception, organizational planning and installation, continued training of the department heads has taken place. During the execution of each of the steps, some of the training is rubbing off on other employees. Nevertheless, the only way to assure uniform understanding of the system is to organize regular training sessions over a period of time.

The actual training should commence shortly after the work on the installation has started to produce definition of procedures. A logical division of the training sessions into one or two hour sessions, held no more frequently than twice a month if they are to be conducted simultaneously with the conversion, should be made.

Approval by management of the installation proposal signals the planning of the initial training period. At this time, management can explain to all employees the reasoning behind the forthcoming system to dispel the usual fears associated with change; how the new system is going to affect them and their jobs. Considerable threat to personal security and possible effect on morale can be avoided through skillful and timely announcement by management. This session should also include, or be shortly followed by, an explanation by the project director of the overall system: what it will

include, the type of device to be used, and a general presentation of some of the reports and controls involved.

While all who are remotely connected or affected by installation of the data processing system should be adequately versed in the broad concept of the system, detailed understanding of the portion with which they are directly concerned must be achieved.

As progress occurs additional training sessions should be held. Each segment of the proposed system must be explained in detail, especially to those who will be working with this area. The chances are that these people had something to do with the development of procedures and the additional training will not be difficult. Except for those who are going to run the computer, it is not necessary for the others to completely understand every step or data processing procedure. They must, however, understand the general procedures.

The merits of visual aids in training demand their use in the explanation and discussion of the installation. There is a major disadvantage in training without some form of visual aid. The better the charts and diagrams and the more logic to their development and presentation, the easier will be the job of explaining their meaning.

It is well to have one chart or diagram encompassing the entire installation. Quite possibly the magnitude of the installation may necessitate splitting the chart for each major application.

The purpose of the training is to promote understanding and acceptance of the system. The more these objectives are achieved, the greater will be the success of the program, which is the desired end result.

#### Instructor qualifications

It is immaterial who performs the detailed training of the company's personnel. Obvious requisites that the instructor must have are teaching capabilities, complete understanding of the over-all system, details of the system, knowledge of data processing techniques and of the company. It may be necessary to engage a professional instructor from one of the neighboring business colleges who, under the guidance of the project director, can effectively organize and present the subject material to the company's personnel.

The anticipated cost of the training program should form an integral part of the proposal to management.

#### The follow-up

A system cannot be left to maintain itself. Careful planning and skilled operation does not preclude the need for scrutiny of data processing systems. The speed with which the equipment executes the decisions of management requires that an equally accelerated means be provided to effectively analyze the system as it functions. If properly designed, the installation includes types of control and analysis programs that will indicate to what extent the system is realizing its objectives.

Decisions voided by changing business climates can usually be conveniently adjusted by first having detected the fact that contrary factors have occurred, then finding a substitute course of action. Quite possibly the substitute action is determined by the solution of a linear programming model.

The procedures about which the system has been developed cannot be permanent, never changing methods. They must be sensitive to changes and continue to reflect management's desire for effective controls and information. The slave becomes the master where policy is dictated by procedure. Rather, the policy should dictate the procedure and the latter must remain a rigid dictum to assure conformance to policy.

Procedures should be instituted with some means of analyzing their effectiveness. With systems and procedures representing practical interpretation of policy, it will be necessary to revise the interpretation as the policy is changed. New techniques and new ideas will also necessitate revision to the procedures.

Refinements in procedure are postponed until after the installation is accomplished, at which time the procedures have passed through a trial period and management has had the opportunity to appraise them. Thus, there are two problems of which to be aware. The first is the ability to evaluate what is currently in use, and the second is the consideration of adapting changes to the system.

One must acknowledge that the data processing system encompasses work that was previously performed by a number of different departments. The more these duties have been interlaced, the more difficulty may be expected in changing one part of it. A large amount of interconnecting and interrelating may require that the entire installation be revamped in order to accomplish a major change to only one portion of the installation.

The initial development, therefore, should use the modular or building block approach in which each segment of the installation has minimum dependency on any other segment and the areas of common reference are developed to make the segment an integral part of the installation. Temporary removal or alteration to one part should not cause collapse of the system.

Adequate provision must be incorporated in the system to permit timely and effective evaluation of the system. Corrective action for modification, or additional procedures to increase effectiveness, must not be overlooked. Each major application of the system must be capably appraised by itself and as part of the entire system. ■



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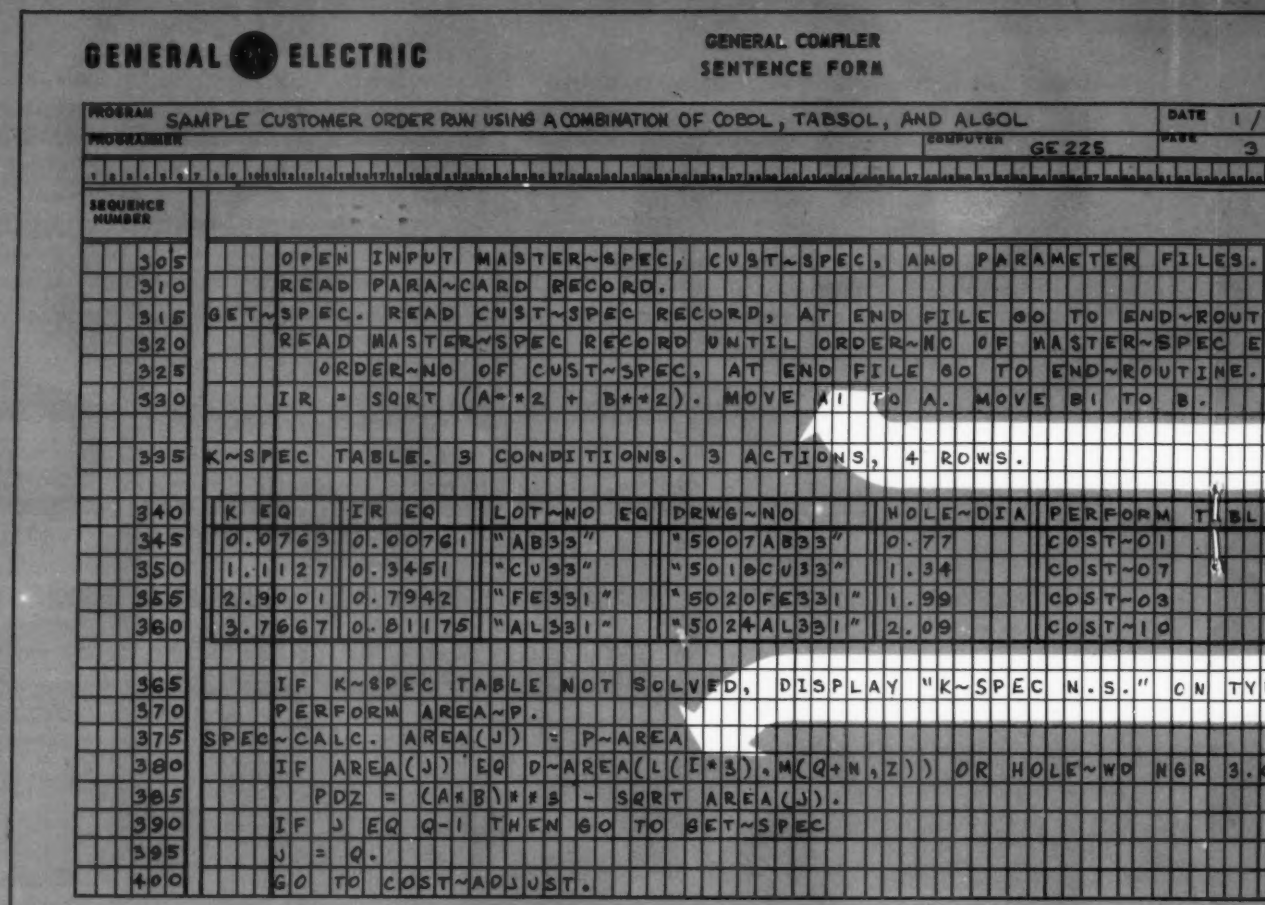
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SENTENCE FORM

PROGRAM SAMPLE CUSTOMER ORDER RUN USING A COMBINATION OF COBOL, TABSOL, AND ALGOL — DATE 1/
PROGRAMMER — COMPUTER GE 225 — PAGE 3

| SEQUENCE NUMBER | |
|---|---|
| 305 | OPEN INPUT MASTER~SPEC, CUST~SPEC, AND PARAMETER FILES. |
| 310 | READ PARA~CARD RECORD. |
| 315 | GET~SPEC. READ CUST~SPEC RECORD, AT END FILE GO TO END~ROUT |
| 320 | READ MASTER~SPEC RECORD UNTIL ORDER~NO OF MASTER~SPEC E |
| 325 | ORDER~NO OF CUST~SPEC. AT END FILE GO TO END~ROUTINE. |
| 330 | IR = SQRT (A**2 + B**2). MOVE A1 TO A. MOVE B1 TO B. |
| 335 | K~SPEC TABLE. 3 CONDITIONS, 3 ACTIONS, 4 ROWS. |
| 340 | K EQ \| IR EQ \| LOT~NO EQ \| DRWG~NO \| HOLE~DIA \| PERFORM T BL |
| 345 | 0.0763 \| 0.00761 \| "AB33" \| "5007AB33" \| 0.77 \| COST~01 |
| 350 | 1.1127 \| 0.3451 \| "CU33" \| "5010CU33" \| 1.34 \| COST~07 |
| 355 | 2.9001 \| 0.7942 \| "FE331" \| "5020FE331" \| 1.99 \| COST~03 |
| 360 | 3.7667 \| 0.81175 \| "AL331" \| "5024AL331" \| 2.09 \| COST~10 |
| 365 | IF K~SPEC TABLE NOT SOLVED, DISPLAY "K~SPEC N.S." ON TY |
| 370 | PERFORM AREA~P. |
| 375 | SPEC~CALC. AREA(J) = P~AREA |
| 380 | IF AREA(J) EQ D~AREA(L(I*3), M(Q+N, Z)) OR HOLE~WD NGR 3. |
| 385 | PDZ = (A*B)**3 - SQRT AREA(J). |
| 390 | IF J EQ Q-1 THEN GO TO SET~SPEC |
| 395 | J = Q. |
| 400 | GO TO COST~ADJUST. |

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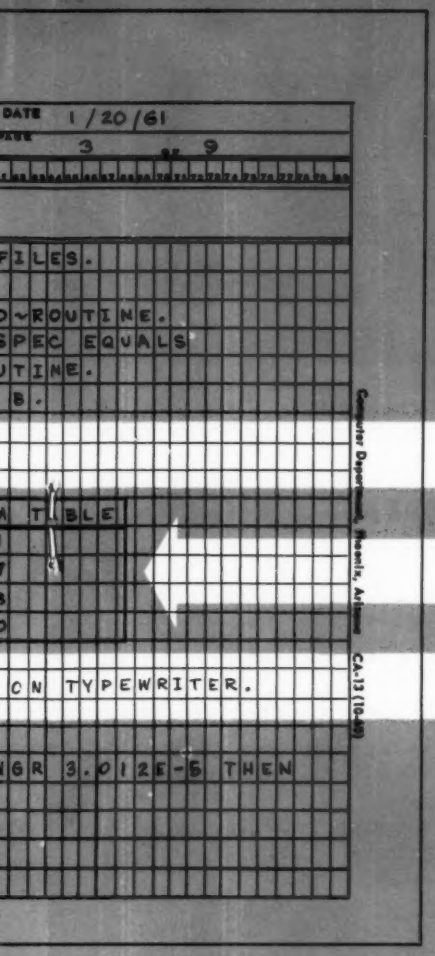
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Marien on FORMS —A Monthly Feature



# How Good Should Forms Paper Be?

RAY MARIEN

ONE OF THE ADVANTAGES obtained from organizing forms control programs in different companies is that it enables one *(initially anyway)* to view all the company's forms. For one of the first steps in such a program is the collection and categorizing of every form in use.

This preliminary step has a secondary feature to it, apart from the establishment of essential numerical and functional files. It gives the forms analyst a look at the *physical* specifications of the forms. Thus, he is able, after sorting through them, to make a fairly accurate guess as to how much money is being thrown away on needlessly rich forms specifications. In many cases, no "specs" had ever been written and it was left to the printer to determine the paper for the job. On some occasions the company was to blame for "gilding" the forms it used. No matter whose fault it is, it usually gives the forms analyst heavy ammunition for his selling job. *Someone*, with little knowledge of paper, had gone overboard and it was costing the company money unnecessarily.

It is easy to remark that *anyone* can come in to a company and save money for them by downgrading their form specs. That statement is not quite accurate, however. First, not just "anyone" can do it. It takes a considerable knowledge of forms paper to be a good forms analyst. Second, a good forms analyst might even *upgrade* the stock sometimes. It all depends on the job that the particular form has to do.

### Paper stock

Generally, it can be stated safely that 80 per cent of all flat, cut, forms can be printed on number four sulphite bond. As time goes on, this figure may go even higher. The number four sulphite sheets of today are often the equal of, or superior to, the number one sheets of a decade ago.

To carry this further, there are many forms that can be printed on *groundwood* content sheets. Saleslips, telegraph blanks, tally sheets, message forms and others of such transient nature need not be on anything more substantial than a piece of paper that will last for a few days or months after use. Why put them on number four sulphite, when a bond sheet is not required?

As sulphite and blended sulphate and sulphite sheets become increasingly stronger and more durable, the use of rag content paper in business forms becomes less important. However, for a company's letterheads, it still seems to be the only logical choice of knowledgeable forms specialists. Undeniably, rag content paper has a snap and body to it that is tough to emulate with other pulps. And the important element of "prestige" should not be discounted. A company letterhead should be on the *best* as long as it is not overdone. Rag content paper will be hard to displace for this use.

Remember also, that even if your company letterhead should be on rag stock, there is no reason to use anything more than white wove sulphite stock for your envelopes. You can match the type face or logo if you wish, but why match the stock? Who sees the envelopes 90 per cent of the time anyway?—The office boy!

In the manufacture of continuous forms and snapouts by long run rotary web presses, the dominant stock is either a number two or four sulphite. Only rarely is number one used. These manufacturers are the pros of the forms printing business. It is quite significant therefore when they select certain grades for the bulk of their printing. The forms they produce are often used in high speed machines under conditions where strength is an important consideration. Yet they invariably run a number two for most such jobs.

Forms printed in carbon-less snap-apart sets may seem to be a luxury to some forms specialists, but they have a definite place in business forms use. They are indispensable in situations where carbon paper disposal is a problem, if not an impossibility. One example we came across recently is at the Canadian border. When people from the U. S. drive into Canada, a customs official stands alongside the car and fills out a vehicle pass by hand. He gives the driver one copy to return when he leaves Canada. Under heavy traffic conditions the customs man sometimes works his way past long lines of cars. Unless he carried a waste bag slung over his shoulder, he'd have no place to stuff carbon paper. Hence, a perfect application for such special stock.

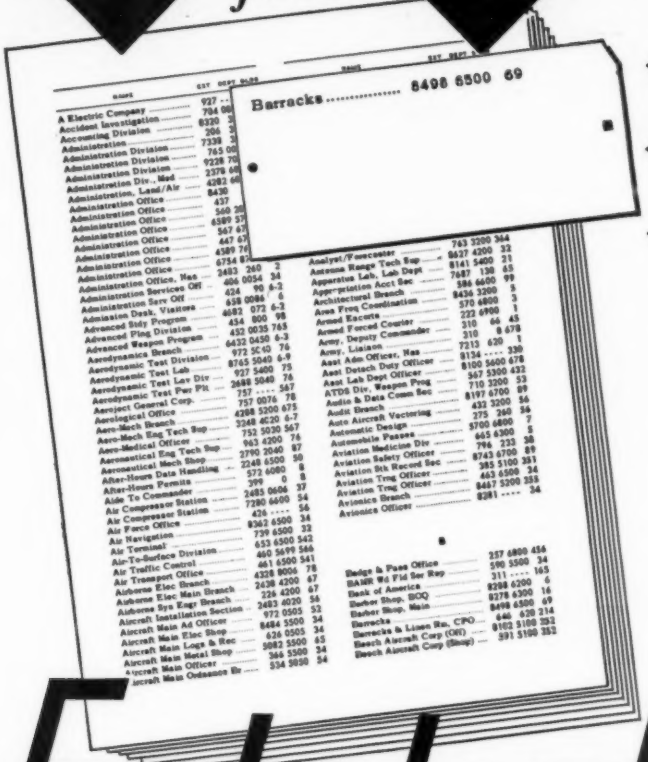
An important point to remember when preparing paper specs for forms is this: "Use the paper that's good enough for the job it has to do—and no better." There will always be paper that can do a *better* job, but forms in general are not semi-precious documents to be sealed under glass for all eternity. They are practical business tools. They should be purchased with that end in mind.

■ ■ ■




"FOR MY NEXT NUMBER I WILL PLAY THE 5th MOVEMENT FROM ORDER NO. 37126-E."

*this* *from* *this*




*←automatically*

*←direct from your files*

*←without typesetting*

*←without error*

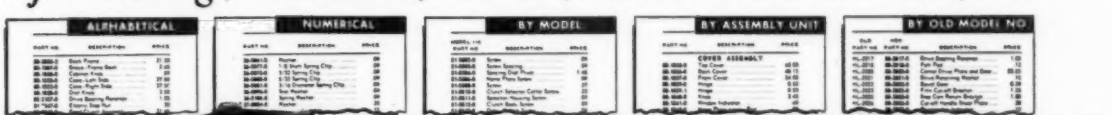
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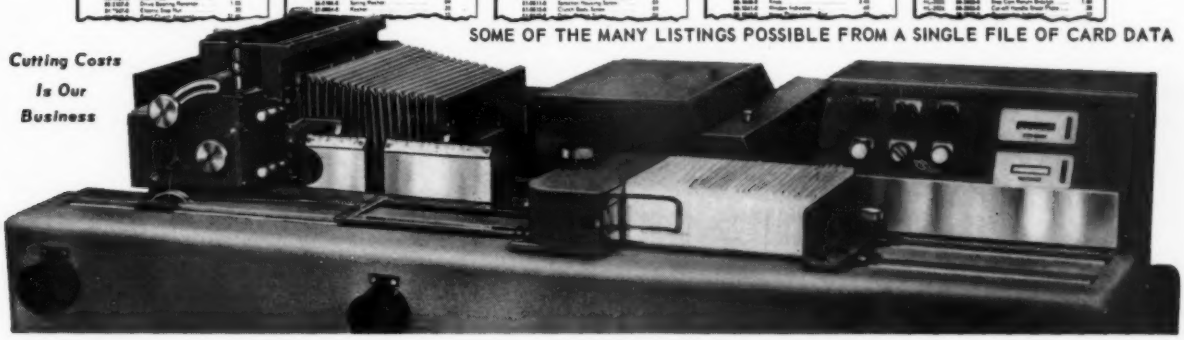
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# Punched Card Ideas



BILL KLUMPP

### Mailing address systems

Publishing companies with a volume of subscribers in the thousands are using punched card masters for addressing their mailing envelopes. Blank card masters are approximately $1.19 per thousand while metal plates cost about $5.90 per thousand. Card masters have more coding space than metal plates and can be processed by sorters, reproducers, collators and accounting machines. Metal plates have a limited space for coding and require hand-sorting and manual refiling.

One punched card replaces one metal plate. This card has about twenty columns reserved for the punching of the last name, the initials, the street number, the city and the state. As many as thirty-six columns can be used for numerical sorting codes. Twenty-four columns are reserved for the address box.

### The procedure with cards

The reproducible imprint containing the mailing address is typed on the card, inside a box, by a standard typewriter which has a special roll of carbon in addition to the usual ribbon. The subscriber's name and address appear on the front of the card in standard typewriter fashion and on the back in carbon.

When it passes through the addressing equipment, this card is pressed briefly against the strip label *(which has been previously moistened with a duplicating fluid)* and a highly-legible carbon impression of the subscriber's name and address is made. The machine turns out completed addresses at a speed of approximately 6,000 per hour. The master impression on the punched card can be duplicated at least 150 times before it wears out.

### Statistical reports

The punched card masters can be counted, sorted and selected for an unlimited variety of reports. The total number of subscribers for each city can be determined. A total for each geographical area can be made. The speed and accuracy of data processing equipment can be utilized. When a group of cards is selected from the main file and processed for a report, these cards can be merged back into the file automatically at speeds of over 200 per minute by a collator.

### Control cards

If your installation balances batches of labor tickets or material requisitions for labor and expense distribution reports, you may find punched control cards convenient for preliminary balancing. These cards replace control sheets for recording the various operations performed on a group of cards. When you design the card form, you provide two boxes on the card and divide one box into the following compartments:

| | |
|---|---|
| Date | Added by |
| Batch number | Distribution by |
| Punched by | Tabulated by |
| Description | Total hours |
| Rates checked by | Total amount |
| Verified by | |

In the second box, you provide compartments for total hours and total amount under the following note: "After tabulated proof is established, this card is punched with the totals for further use as a master card."

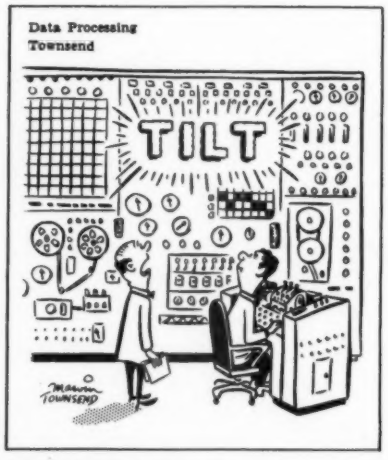
As each of the various operations is performed on a pack of cards, the person who performs the operation initials the control card in the space provided. Total hours and total amount are printed directly on the card in the second box by the accounting machine when each batch of detail cards is tabulated. You then have a printed permanent record of balances. After the balance is established, the totals are punched in the card. You then have a labor or material master card.

You can tabulate the master cards on an accounting machine for a grand total. If this total does not balance to the adding machine total of the original documents, you can list the cards for the purpose of checking each batch. A small group of master cards is normally easier to handle and to file than a stack of irregularly sized accounting machine lists.

### Preventing confusion

Do you have a punched card application in which one-half of the card is used one month and the other half the following month? If you have been using a repeat-punch in a particular control column, you have been using considerable machine time and reducing the economy of the second use of the card. Why not try the spray method?

You stack the cards to be marked in a sorter rack. You then spray them with ink along the edge that has been used, leaving the unused edge in contrast. A large number of cards can be marked in a few minutes. You can use a convenient hand spray, similar to the kind used by artists for air-brushing illustrations, which can be obtained from any artist's supply store. ■




"LOOKS LIKE WE FED IT THE WRONG INFORMATION AGAIN."




# PANEL WITH A PEDIGREE... AND PAPERS TO PROVE IT!

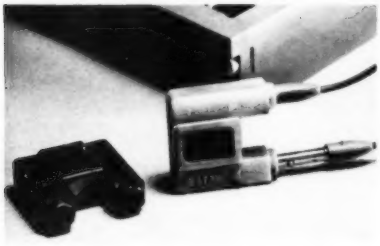
Now . . . for your convenience . . . *every PWI panel is clearly imprinted with its individual serial number!*

Each PWI panel is required to meet rigid quality control standards—must conform exactly to master-crafted prototypes before being cleared for warranty certification. Now . . . because our customers have told us it would be helpful to them . . . every control panel is imprinted with its individual serial number; the same number appearing on the accompanying warranty certificate. These individually numbered panels aid job identification, make inventory easy, assist in keeping track of panels.

Only a manufacturer like PWI with complete in-plant control of the entire manufacturing cycle can give you such positive assurance of quality.

PWI . . . panel with a pedigree . . . and papers to prove it!

**PWI FILTERS for electronic and electro-mechanical computors and tabulators.**



These filters eliminate objectionable "feedback" on back circuits . . . are designed for convenient installation. Not merely simple diodes but a combination of elements molded in high strength plastic material . . . fully protected against moisture and physical damage.

Two types available: GAMMA FILTER with continuous load rating of 12 and suitable for virtually any load rating/duty cycle combination apt to be encountered in any Feature.

DELTA FILTER has a continuous load rating of 2 and can be operated to 4 at increased duty cycles.

Circle no. 11 on reader service card.

Send today for the free 12-page handy booklet, "Wire complements . . ."

*PWI Panels Wires Incorporated.* dp
213 East Grand Ave, South San Francisco, California
Gentlemen: Please send me FREE 12 page booklet, "Pocket Guide for self-contacting wire complements."

NAME _____

FIRM NAME _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

PWI *Panels Wires Incorporated*
213 East Grand Avenue, South San Francisco, California

# COMPUTER CENSUS

## Survey of Computer Use

THE INSTALLATION OF A COMPUTER a decade ago called for front-page coverage in the metropolitan newspapers; the nation's interest in such matters, however, appears to have diminished since then, to the extent that now the usual public announcement is the manufacturer's advertisement in a financial paper or trade magazine.

And this is as it should be. Not even the most enthusiastic data processor believes that his subject is dear to the hearts of everyone. Yet many people are interested in the progress being made in the computing field; where can they get information about which machines have been installed, and in what quantities?

*Data Processing* has found that the answer to this question is difficult to find. The manufacturers have not been too cooperative, several regarding the information as "classified." We have seen a number of computer surveys over the years, and have questioned their validity, since sources of information are not given. And there is often a wide difference between two reports appearing at about the same time, leading us to doubt these surveys even further.

Some time ago the Research Department at Gille Associates, Inc. started collecting material for our new Equipment Encyclopedia. We put into a file whatever information on computer installations we could *verify*. We know our file is not yet complete; for example, we have not included any count of punched card calculators. It does, however, afford a base from which a reasonably accurate computer survey can be made at this time. Furthermore, our file will become more accurate as time goes by. Some day we may be able to present a computer survey with absolute assurance that the information is completely accurate as of a particular date. Right now, although we can make no such claim, we do feel that this "nose count" is the best available.

Every effort has been made to substantiate the figures in the chart. Several of the manufacturers upon

**COMPUTER CENSUS (3-1-61)**

| MANUFACTURER | COMPUTER | U. S. GOV. 6-30-60[1] | Delivered[1] | On Order[1] |
|---|---|---|---|---|
| ALWAC CORP. | ALWAC | 3 | 41 | 2 |
| AUTONETICS | RECOMP. | 3 | 75 | 65 |
| BENDIX | G-15 | 30 | 380 | — |
| BENDIX | G-20 | — | 0 | — |
| BURROUGHS CORP. | E-101; E-103 | 24 | 150 | 50 |
| BURROUGHS CORP. | 204; 205 | 26 | 110 | — |
| BURROUGHS CORP. | 220 | 10 | 49 | 12 |
| BURROUGHS CORP. | 5000 | 0 | 0 | — |
| CONTROL DATA CORP. | 160 | — | 30 | 50 |
| CONTROL DATA CORP. | 1604 | 1 | 14 | 10 |
| DIGITAL EQUIP. CORP. | PDP-1; PDP-3 | — | — | 1 |
| FERRANTI | ATLAS | — | 0 | 1 |
| FERRANTI | ORION | — | 0 | 10 |
| FERRANTI | PEGASUS | — | 30 | 38 |
| GENERAL ELECTRIC | GE 210 | — | 23 | 28 |
| GENERAL ELECTRIC | GE 225 | — | 5 | 38 |
| HONEYWELL | 400 | — | 0 | — |
| HONEYWELL | 800 | — | 12 | 50 |
| IBM CORP. | RAMAC 305 | 54 | 875 | 175 |
| IBM CORP. | 650 | 154 | 1350 | 25 |
| IBM CORP. | 1401 | 1 | 75 | 4000 |
| IBM CORP. | 1410 | — | 1 | 150 |
| IBM CORP. | 1620 | — | 100 | 400 |
| IBM CORP. | 704 | 33 | 115 | — |
| IBM CORP. | 705 | 35 | 160 | — |
| IBM CORP. | 709 | 9 | 45 | — |
| IBM CORP. | 7070-7074 | 2 | 35 | 320 |
| IBM CORP. | 7080 | — | — | 80 |
| IBM CORP. | 7090 | 4 | 50 | 150 |
| IBM CORP. | STRETCH | 1 | 0 | 5 |
| MONROE | MIX; M XI | — | 109 | 105 |
| NATIONAL CASH | 304 | 4 | 40 | 15 |
| NATIONAL CASH | 315 | 0 | 0 | — |
| NATIONAL CASH | 390 | — | 5 | 150 |
| PACKARD BELL | PB 250 | — | 9 | 31 |
| PHILCO CORP. | 2000 | 2 | 10 | 22 |
| RCA | 301 | 0 | 0 | 65 |
| RCA | 501 | 6 | 50 | 60 |
| RCA | 601 | 0 | 0 | 5 |
| RAMO-WOOLDRIDGE | RW 400 | — | 2 | 5 |
| REMINGTON RAND | FILE COMPUTER | 20 | 127 | 6 |
| REMINGTON RAND | LARC | 1 | 2 | — |
| REMINGTON RAND | UNIVAC ss80/90 | — | 207 | 255[2] |
| REMINGTON RAND | UNIVAC II, I | 11 | 74 | 1 |
| REMINGTON RAND | UNIVAC III | 0 | 0 | 35 |
| REMINGTON RAND | 490 | 0 | 0 | 9 |
| REMINGTON RAND | 1103 A, 1105 | 17 | 45 | 3 |
| REMINGTON RAND | 1107 | 0 | 0 | — |
| ROYAL PRECISION | LGP-30 | 35 | 430 | 12 |
| ROYAL PRECISION | RPC 2000-4000 | 10 | 19 | 40 |
| ROYAL PRECISION | RPC 9000 | — | 6 | 18 |
| SYLVANIA | 9400 | — | 2 | —[3] |
| UNDERWOOD | ELECOM | 5 | 11 | 0[4] |
| Other Special Computers | | 46 | — | — |
| TOTAL | | 540 | 4928 | 6502 |

**NOTES**

1. Zero (0) represents none reported; dash (—) represents unreported and unknown. (Includes governmental total in delivered.)
2. Includes foreign orders and installations.
3. Information from Sylvania: These are not marketed, for internal use.
4. No longer in production.

checking our figures told us that we have made "good guesses" on their equipment; a few even told us how far wrong we were, allowing us to correct several entries. We would expect that our "delivered" column is much more accurate than our "on order" column. There are too many tentative orders to place much faith in the latter. In a field as volatile as this, changes occur from day to day which in the aggregate tend to obsolete any dated report. The figures for the U. S. Government are the most accurate; these are the most recent published by the Department of Commerce.

The largest single figure in the table, the 4,000 IBM-1401 computers on order, was released to IBM stockholders; it may be considerably higher than that now, though we have no idea how much higher. Furthermore, we can think of no reasonable way to find out. The same may be said for many of the larger table entries. ■

## CLASSIFIED

### Accessory Equipment

PANELS & WIRES, ETC. NEW — PWI RECONDITIONED & GUARANTEED — IBM. Write for list, we quote. A. E. Bohlander, 12472 E. Outer Dr., Detroit 24, Mich., TU 2-4634.

**CLASSIFIED ADVERTISING AVAILABLE**

Looking for more help or a chance to relocate? Your classified ad in DATA PROCESSING will get results at low cost.

Looking for used equipment or do you have some to dispose of? A classified ad in DP will do the job.

DATA PROCESSING is read by more than 20,000 persons in over 10,000 different companies.

Rates are 50 cents a word with a minimum of $10.00 per insertion. Payment should accompany order. Confidential ads will be assigned box number and all replies sent to you unopened. Add $2 per insertion.

Address
Classified Dept.
DATA PROCESSING
22nd Floor Book Tower
Detroit 26, Michigan


*Now* VPC MANUAL PLUG WIRE



*Newest wire since panels were built!*

**SINGLE-PIECE CONSTRUCTION**

Here's brand new concept in plug wire design. One-piece plug construction completely eliminates tip or terminal breakage when bent — cannot fall apart shorting machine back panels.

**CAPTIVE SPRING**

Two-way captive spring permits wire to pull out easily (exceeds IBM pushout requirements) yet provides strong-set lock.

**PATENTED "F" CRIMP**

Plugwire tip applied with patented "F" (bare wire) crimp technique prevents corrosion . . . assures use of highest possible contact area . . . greater tensile strength . . . all assuring maximum electrical performance.

VPC permanent self-contacting Plug Wires also incorporate the "F" crimp. Complete inventory of all types wires for use in computers and other related systems using fast change-over connections. Immediate shipment.

Wherever there's an IBM installation there's a VPC Service Representative nearby.

VPC

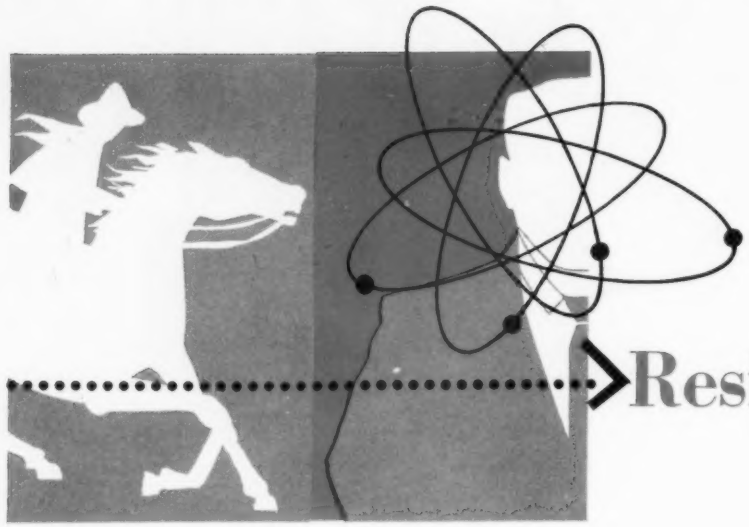
**VIRGINIA PANEL CORPORATION**

**VIRGINIA PANEL CORPORATION**
Dept. DP • Waynesboro, Virginia

Yes, send me complete details and prices on VPC
☐ Manual, or ☐ Permanent Plug Wires.

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE_____ STATE_____

Circle no. 13 on reader service card.



# Resident Analyst

**Every business needs an on-the-spot analyst.**

**By Prentice E. Chaney**

SPEED has been the goal of accomplishment by the business world since the days of the Pony Express. The race to obtain competitive advantages through the medium of speed has resulted in the development of electronic gadgets of all sizes. Within the scope of gadget invention and practical application we are becoming engulfed in a civil war between management theories and economic welfare, even actual economic survival.

The struggle in management circles during the past few years has been centered around modern day competitive activities and based entirely upon speed. The aims are toward faster production of products, faster production of statistics, and faster knowledge of progress. These are indeed expensive desires *(when measured in time)* that can be obtained at a low cost through application of sound economical techniques that will accomplish these desires and provide trained management material as a side line product without reducing potential sources of revenue.

In our desires to overcome competition we must first bring order to what appears to be a chaotic confused approach by facing realities and reorganize from within. A methodical approach through cooperation and unity will overcome any type of competition.

### Methodically improve

Any business whether it be a one-man type or a corporation has a very definite need of research toward better ways of doing things in order to meet competition. Improve your operation and you are a step ahead of your competitor. The tortoise won the race by advancing step by step. The hare lost the race because of his dependence upon *speed.*

In order to compete with modern day competition regardless of the field of endeavor, it is necessary to place a team in the management field that will produce a goal of unity, coordination of effort, and trained management material.

The foreman of the shop or the office manager are persons deeply involved in the day-to-day operations of production and the accounting for the production. Because of the results to be obtained, management has become so involved that time for research is not available, and evaluation of adopted methods and procedures can not receive proper attention.

In fact, changes in methods and procedures are believed not to be necessary because actual operational experience has proven the value of presently used methods and procedures. Change is not necessary — is the belief. The methods in use are producing so why disturb them.

Due to this veil of experience-belief the front line management becomes so steeped in doing things in a prescribed way that changes for betterment are deemed definitely unnecessary.

A shop foreman of today is a man that can get production and keep the wheels rolling through a technique of drive and pressure applied on an assembly line basis. Top management may seek improvements through employing a stop-watch man to check production activities in the plant. This improvement effort usually produces plans for applying direct pressure to the low spots of individual efforts.

### On-the-spot analyst

In order to obtain a fair return from the investment, and establish continued benefits, the present day forms of improvement efforts must be replaced with a more modern technique. There should be a methods analyst on the departmental organization team. An on-the-spot methods analyst is something to be desired.

A person trained in work simplification is of great benefit to any management team. The basic number of persons trained depends on the size of the business. In a small business someone should learn the techniques of work flow, layout, and work simplification. In larger businesses several persons should be trained in this field. If the way we do, what we do, requires X number of hours, it is possible to discover a way to do what we do in Y number of hours. This discovery permits us to use the hours gained in relaxing, thinking, planning, and expanding.

It does, however, become more difficult to research and improve as the size of the business increases. It is in this area that methods and procedures presently in use merely expand with the growth, they do not change. Therefore, plans for enlarging a business should contain specifications for a methods analyst. At first the analyst may be a part time man and as the operation grows he naturally grows with it into a full time analyst. An experienced methods analyst is good material for management positions, in fact, the tools of an analyst are a basic must in modern management training.

### Authority necessary

Many firms have a methods department that operates without authority and with weak management backing. This type of effort is costly and produces very little actual improvement progress. Under this arrangement the analyst often finds he receives little cooperation from those with whom he tries to work and consequently his efforts result in discouraging progress. Basically this situation is due to a lack of departmental prestige and failure of management to give depth to the operation within the organization structure. For instance, within the organization where a plant manager, plant superintendent, comptroller, and methods manager exist, the superintendent may find an analyst from the methods department doing some research; someone from the comptroller's office planning an incentive program; a representative from the manager's office conducting a production control idea. All working independently, and all actually becoming a daily nuisance to the superintendent and his assistant with often the same questions being asked of the same individuals by three different departments

*(continued on next page)*

## Coming Events

**APRIL 13 - 14**

Univac Users Association
Statler Hilton Hotel,
Los Angeles, Calif.
*Contact*: D. B. Haughton,
c/o Westinghouse Electric Co.,
Pittsburgh, Pa.

**APRIL 17 - 21**

Office Equipment Manufacturers Exhibits, Inc.
Business Equipment Exposition
New York Coliseum, New York
*Contact*: Malcolm M. Semple, Dir. Pub. Info., OEME, 777 Fourteenth St., N.W., Washington 5, D. C.

**APRIL 18 - 21**

Univac Users Association Use Meeting
El Paso, Texas
*Contact*: J. W. Nikitas, Exec. Secy. USE, 315 Park Ave., So., New York 10, N. Y.

**APRIL 19 - 20**

15th Annual University of Tulsa Conference of Accountants
University of Tulsa Campus, Tulsa 4, Okla.
*Contact*: Carl J. Senger, Warren Petroleum Corp., Tulsa, Okla.

*(continued on next page)*


**BEEMAK TAB CARD HOLDERS**



**BP-100 CARD HOLDER**

Can be attached to products, conveyor belts, bins, boxes, shelving, to implement production control, inventory control, invoicing and other punched card systems. Beemak Holders have withstood hard usage for eight years and are made in ivory, red, green, blue, yellow and black for color coding if desirable. Keeping correct tab cards at the source of record data provides better controls and faster handling of all types of merchandise.





**BP-130 MAGNET HOLDER**

Card holder with four heavy permanent magnets can be attached or hung on any metal surface such as tab machine, filing cabinet or metal desks. Provides finger-tip accessibility to operators, reduces wasted time and chances of error.

1 to 24 $1.50 each; 25 to 49 $1.35 each; 50 or more $1.25 each. Available for immediate delivery from

**BEEMAK PLASTICS**
7424 SANTA MONICA BLVD., LOS ANGELES 46, CALIF.
Circle no. 12 on reader service card.

at perhaps different times.

This kind of technique is wasteful of time, effort, and money. There is no coordination of the organization, but there is an under-current of chaotic conditions resulting in unwritten departmental competitive activities and jealousies, as well as employee opposition.

The modern way to overcome this kind of confused effort is simply to streamline the overall motive. Assign a methods analyst to each shop superintendent and one to the general office operation thus creating a team assistant.

**Resident analyst**

Give these analysts the status of resident analyst — something new, but something necessary. This new member of the management team will work with the superintendent as his assistant, methods advisor and methods trouble-shooter. He will maintain a shop organization chart, work flow chart, production schedule chart, floor layout, also maintaining a file of job duties and qualifications, and job procedures. Having all of this information at his command he will be able to solve many problems in the methods and procedures field, provide information to other departments, work with other departments in plans for incentives, job evaluations, production charts, etc., thus permitting the superintendent or office manager full time for planning and supervising his operation.

In all cases the resident analyst becomes the individual who answers all the questions and prevents various people from interrupting the work activities by interviewing and re-interviewing the employees while working on the job. He becomes a well trained person, familiar with the inner workings of each job and the operation to which he has been assigned. His particular area of activity becomes closely related to the areas of the other resident analysts through regular get-together conferences of the methods department. Herein lies the course of unity and cooperation — the opportunity of coordinating the overall goals and predicting the future successes of the business.

Every type of business must have some way in which it can tie together the operations and research work into a single goal of simplification and organization. Thus the overall objective to be obtained through the methods department program of resident analysts is management training, and centralization of simplification and survey information.

The methodical approach for a feasibility survey of electronic equipment and its practical application lies within the scope of the resident analyst's knowledge and experience. Thus the key to the extensive prior planning and analysis necessary to determine the economical feasibility of automation is held by the resident methods analyst.

*(Continued from preceding page)*

**APRIL 19 - 21**
13th Annual Southwestern IRE Conference,
Memorial Auditorium, Dallas, Texas

**APRIL 30 - MAY 9**
German Industrial Fair
Hanover, Germany

**MAY 1 - 2**
Association of Records Executives and Administrators 4th Annual Conference on Records Management
Hotel Roosevelt, New York, N. Y.
*Contact*: Miss Judith Gordon, Publicity Chairman, AREA Conference, % Metal and Thermit Corp., Rahway, N. J.

**MAY 2 - 4**
Detroit Business Show
Cobo Hall, Detroit, Mich.,
*Contact*: Miss Virginia Stone,
817 Penobscot Bldg., Detroit 26, Mich.

**MAY 2 - 4**
IRE Electronic Components Conference
Jack Tar Hotel, San Francisco, Calif.

**MAY 4 - 7**
Institute of Office Management National Conference
56 Victoria St., London, S.W. 1, England

**MAY 7 - 10**
NOMA 42nd International Conference
Sheraton-Jefferson Hotel, St. Louis, Mo.
*Contact*: W. H. Latham, Field Service Division, NOMA National Office, Willow Grove, Pa.

**MAY 9 - 11**
Western Joint Computer Conference, IRE, AIEE and ACM
Ambassador Hotel, Los Angeles, Calif.
*Contact*: Dr. C. T. Leondes, Dept. of Engineering, University of California, 405 Hilgard Ave., Los Angeles 24, Calif.

**MAY 14 - 17**
Insurance Accounting and Statistical Association Annual Conference
Biltmore Hotel, Los Angeles, Calif.
*Contact*: L. J. Hale, Sec.-Treas., IASA
Kansas City Life Insurance Co.
Kansas City, Mo.

**MAY 15 - 16**
RCA 501 Users Association Meeting
Pittsburgh, Pa.
*Contact*: Frank W. Warber, 112 E. Washington St., Bloomington, Ill.

**MAY 15 - 17**
IRE Microwave Theory and Technics National Symposium
Sheraton-Park Hotel, Washington, D. C.
*Contact*: Gustave Shapiro, National Bureau of Standards, Washington, D. C.

**MAY 16 - 18**
Second National Conference on Banking Automation, sponsored by Detroit Research Institute
Detroit Leland Hotel, Detroit, Mich.
*Contact*: Dr. A. W. Jacobson,
12 E. Hancock, Detroit, Mich.

**MAY 18 - 20**
Federal Government Accountants Association 10th Annual National Symposium
Hotel Shoreham, Washington, D. C.
*Contact*: Charles A. Phillips, Gen. Chairman,
c/o FGAA, 1523 L. St., N. W.
Washington 5, D. C.

The UNIVERSITY OF FLORIDA at Gainesville, is holding its Second Annual Conference on *Automation and Data Processing*, April 20-22, 1961. This is held in conjunction with all the Florida chapters of NMAA, NAA and NOMA. Further information may be obtained from John T. Branch, Jr., Business and Industrial Services, General Extension Division of Florida, 806 Seagle Bldg., Gainesville, Fla.

CORNELL UNIVERSITY *Industrial Engineering Seminars* will be held June 13-16, 1961. These seminars are planned for personnel in industrial engineering, operations research, research and development, quality control, production control, cost control, materials management; purchasing, data processing, and controllers. Further information may be obtained from J. W. Gavett, Seminars Coordinator, Department of Industrial and Engineering Administration, Upson Hall, Cornell University, Ithaca, N. Y.

The UNIVERSITY OF PENNSYLVANIA's special summer session includes four two-week programs from June 4 - July 15. For information and further details write Professor Morris Rubinoff, Coordinator, 1961 Special Summer Session, The Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia 4, Pa.

Programs included are:

Modern Radar Techniques
New Devices for Amplifications and Switching
Communication, Theory and Information Handling Logic, Switching Systems, and Automata

The UNIVERSITY OF MICHIGAN is offering an intensive special program this summer in the following courses. Details may be obtained from Raymond E. Carroll, Coordinator, College of Engineering, University of Michigan, 126 W. Engineering Bldg., Ann Arbor, Mich.

The courses, which run for varying periods from June through August 31, are:

Intermediate Numerical Analysis
Advanced Numerical Analysis
Digital Computer Engineering
Theory of Computing Machine Design
Programming Concepts
Operations Research and Management Sciences
Modeling and Simulation in Operations Research
Advanced Data Processing, and others.

# MICR EQUIPMENT



## HANNIFIN CHECK CONDITIONER

A new check conditioning machine for rejuvenating mutilated magnetic ink and punch card checks has been announced by the Hannifin Company of Des Plaines, Ill., a division of Parker-Hannifin Corporation.

One of the major causes of reduced efficiency in the automatic processing of magnetic ink and punched card checks has been check mutilation. The mutilated check must be handled as a special case, hand-carried through the processing cycle as quickly as possible so that it can be returned to its digital group. This slows the entire processing operation and creates opportunities for error. The Hannifin "Silent Squeeze" Check Conditioner will rejuvenate even the most crumpled check. Because of its 288,000 check per day capacity, all checks can be given the restoration treatment at a pace comparable to the speed of automatic processing equipment.

The Hannifin "Silent Squeeze" Check Conditioner occupies just eight square feet of office floor area. It can be run with full safety by any office worker and does not require a full time operator. Simply load and unload the machine, the remainder of the cycle is automatic. Parker-Hannifin regional sales and service offices are located in all major metropolitan areas.

**Circle no. 30 on reader service card.**

## BURROUGHS MICR EQUIPMENT

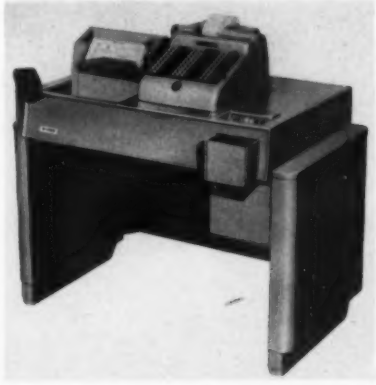
### Imprinter

On premise pre-printing for new accounts puts MICR information on checks in proper position and in specified tolerances.

### Amount and account number printer

The P703 Amount and Account Number Printer is used for proving and encoding magnetic ink amounts on checks in a single operation. Amounts and transaction codes are printed automatically as a by product of proving. The machine has a keyboard of 12 columns listing, 10

*(continued on next page)*



columns for adding, subtracting, and total; encoding has 14 bits posting amounts, 12 bits posting account numbers. Characters are ⅛" high, spaced .125" and printed ¼" from bottom, skew in relation to bottom is plus/minus 1.5

### Sorter-reader

The B101 Sorter-Reader reads and processes checks, deposit tickets and other documents of intermixed size and thickness at 1,560 a minute. It also processes items that have been folded, stapled or torn. It reads an MICR symbol in 32 millionths of a second.

### Electrostatic multi-printer

The S801 uses four independent printers mounted in a single console which utilizes two 27-column and two 18-column printers. These printers produce independent tapes by electrostatic printing, and when geared to sorter-reader data, work at 1560 documents a minute without utilizing full capacity of printer. Master tape and any one of three remaining tapes are printed simultaneously at 10 lines an inch utilizing 23 different characters.

### Control unit

The B301 Control Unit is a special purpose, solid state electronic computer containing central control panel, magnetic core memory, arithmetic unit, logic and control circuitry and plugboard programming. The memory is linear magnetic core, 30 word capacity *(11 five-bit numeric digits and a special five-bit sign)*.

The B301 Magnetic Document Processing System consists of the Sorter-Reader, Electrostatic Lister, Magnetic Tape Unit and Edit Control Units for proof listing and conversion of the source document data for further processing on data processing systems such as the Burroughs 220.

Circle no. 31 on reader service card.



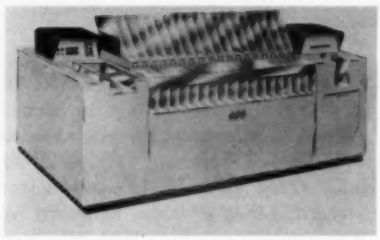
## NATIONAL DATA PROCESSING CORPORATION MICR EQUIPMENT

### Encoders

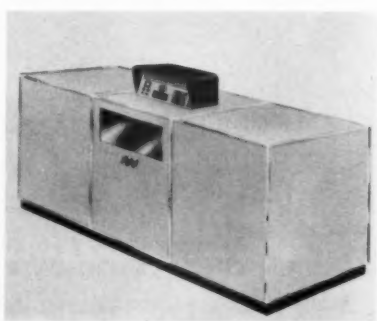
Five models of encoding machines are available. The Proof Machine Encoder attaches to a standard IBM 802 or 803 Proof Machine and provides the amount encoding as a by product of proofing. The Adding Amount Encoder enters amount and control data information on documents, accumulates two proof totals and prints a proof list on adding machine tape. The Account Number Encoder and the Bank Number Encoder provide for encoding the remaining check fields.

### Processor

There are three models of processors. The basic sorter, 201, has 18 pockets of which two serve for rejects. The sorting speed is 1,200 documents a minute. It has self checking features such as on-us bank number verification and customer account number check digit. It sorts in two modes: **1)** conventional digital sort to the first 10 pockets of the machine, with outsorting of high activity items to six pockets; **2)** sorts selected high activity items to all 16 sort pockets and two reject pockets. This multiple pocket outsorting is done through use of a memory device which stores the high activity numbers with their destinations. Data on checks is on temporary storage within sorter and available for readout to peripheral equipment.

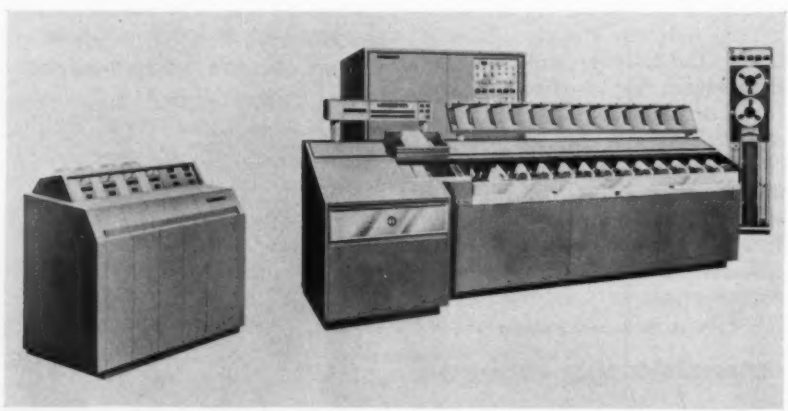


The 202 includes all features of the 201 plus a 24 column lister with a capacity for accumulating three totals. The lister prints at 1200 lines a minute and can list accumulated totals such as batch, cash letter, and master total. The 203 is the same as 202 but contains 16 additional accumulators providing totals for each of the sorting pockets.



### Dictionary look up

The NDP Dictionary Look-Up control units may be used with any of the three processor models. This provides sorting, to 4096 end points for instance, in the maximum of three sorting passes; or to 65,536 end points in a maximum of four sorting passes with another model. The Look-Up control will direct the operation of up to three document



The Burroughs B301 Bank System includes, left to right, S801 Electrostatic Multi Printer, B101 Sorter-Reader and Magnetic Tape Unit. In the background is the B301 Control Unit.

processors simultaneously and provides two separate sort programs, either of which may be used for any one of the connected processors. There is also equipment for the conversion of data read from the documents passing through the sorter. Data conversion units are available to intercouple the document processor to most banking machines or to provide offline, computer compatible magnetic tapes.

**Circle no. 32 on reader service card.**



## INTERNATIONAL BUSINESS MACHINES MICR EQUIPMENT

### Inscriber

The IBM 1202 Utility Inscriber is used for printing in MICR: account numbers on checks which are not pre-printed, and processing data from original documents to substitute documents or carrier envelopes It is a specially designed typewriter equipped with a 14-key keyboard; containing 0-9 numerical keys and four special symbol keys.

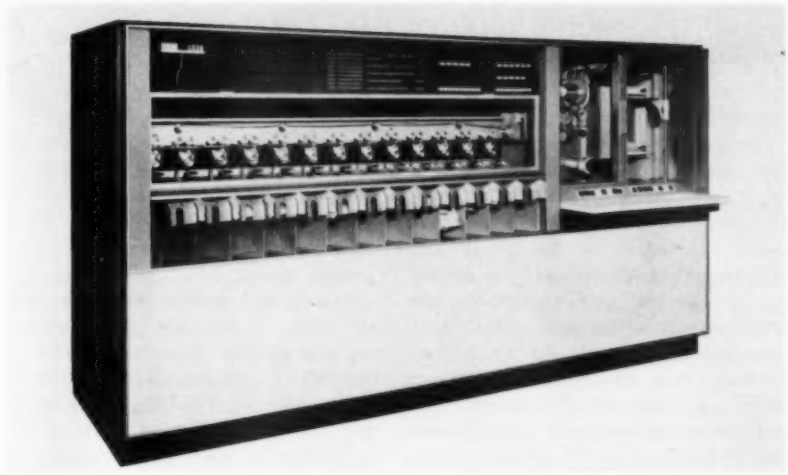
### Proof inscriber

The 1201 Proof Inscriber adds the functions of MICR amount inscribing to the normal functions of the 803 Proof Machine.

### Sorter-reader

The 1210 Sorter-Reader reads and sorts intermixed documents of random-size up to 900 documents a minute. Three models are available: one works with the IBM 1401 data processing system, one contains all necessary circuitry for direct entry of data into the 650 system, and the third is internally controlled for input into the Ramac 305. As an input unit, inscribed characters may be accumulated, printed, or summarized in the 407 at 300 documents a minute. Readout may be to magnetic tape for other units.

**Circle no. 33 on reader service card.**



## NATIONAL CASH REGISTER COMPANY MICR EQUIPMENT

### Sorter

Pitney-Bowes National Magnetic Character Sorter sorts at 750 a minute, intermixed documents of varying lengths, widths and thicknesses. It has 12 compartments for storage: one for each digit *(0-9)*; one for rejects; and one for items needing no further sorting. Each compartment has an individual stacker which holds 1200-1500 items with limit switch for cutoff when filled. Anti-jam mechanism causes any stoppage of transporting unit for removal of badly multilated item. The sorter can be connected to an electronic controller, a high-speed lister, low-speed lister, and punched paper tape recorder. The controller will verify bank number, account number, and provide balancing and control totals at 750 items a minute. The information can be relayed to the listers or punched paper tape recorder, for further processing on the Post-Tronic.

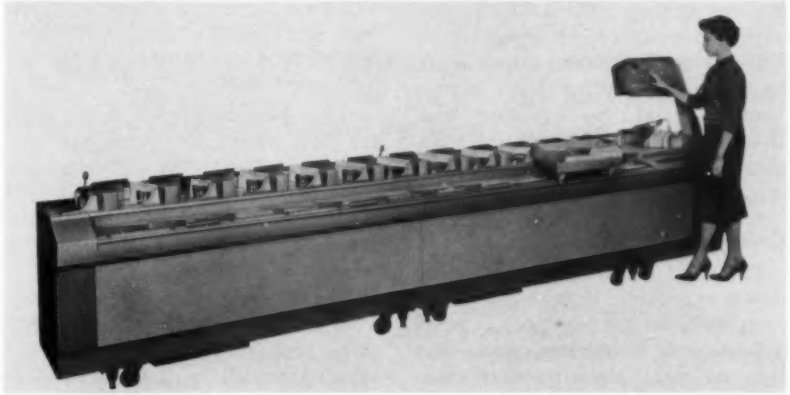
### Magnetic amount printer

The Magnetic Amount Printer imprints amounts on checks, deposits and other media in MICR as a by product of proof procedure. It can be coupled with any National Class 2000 Proof Machine already in use, with slight modification of the proof machine.

### Magnetic qualification printer

This is an on-premise MICR printer for account numbering of checks and deposit slips for new accounts. The printer keyboard has twelve rows of keys, a repeat key, release key and motor bar. Ten rows of keys are for account number, and two for transaction numbering. Zero printing is automatic. Hyphen and account number symbol are automatic.

**Circle no. 34 on reader service card.** ■



DeParis on EQUIPMENT —A Monthly Feature

# Honeywell Systems



JOSEPH R. DE PARIS

MINNEAPOLIS-HONEYWELL, with its Honeywell 800 and Honeywell 400 data processing systems, promises to compete aggressively for an important share of the computer market. Minneapolis-Honeywell arrested the attention of computer users some years back when it introduced the Datamatic 1000, a large-scale computer with a unique three-inch wide magnetic tape. Since that day, evolution and technology being what they are, the D-1000 has had to make way, as have all the first generation computers, for the solid state, transistorized, building block computer generation.

The Honeywell 800 is Minneapolis-Honeywell's large-scale system and the 400 its medium-scale system. Here are some of their characteristics and specifications. Both systems use the same basic command structure, with some operation codes exclusive to the 800. The logic is based on a three address instruction code. In a three address system a single command consists of operation code, A address, B address and C address. For example: *Add* the contents of *A* to the contents of *B* and store the result in *C*.

Programs written and assembled for the H-400 will run without change on the H-800. FACT, Honeywell's English language compiler, is available now for the 800, January '62 for the 400. Obviously, there is a high degree of compatibility between the two systems. Think of the ease with which a user can expand from a 400 to an 800 system. Consider the benefits in a situation where branch locations might be equipped with H-400 systems to feed data to headquarters, equipped with an H-800 system.

### Compatibility

The word structure of these computers is common to both. These are fixed word length machines, a word consisting of 11 decimal digits plus sign or eight alpha/numeric characters. Internal speeds differ between the 800 and the 400. The memory cycle in the 800 is six microseconds per 10-character word; in the 400 it's 24 microseconds. Memory cycle refers to the time required: **1)** to read data from a word in the core storage, and **2)** to regenerate that data in the core positions that were read out (because read out from the core is destructive).

Magnetic cores are the internal memory medium in the H-800 and the H-400. A basic 800 system has a module of 4096 words with additional modules available up to 16,384 words. The basic 400 comes with 1024 words which can be augmented in modules up to a maximum of 4096 words.

Magnetic tapes are the external memory medium. Both systems use the same tape and tape units. There is one passing speed — 96,000 decimal digits per second or 64,000 alphabetic characters per second. Data is stored on tape in fixed word lengths but with variable record lengths. The density is 800 numeric digits per inch or 537 alphabetic characters per inch. Up to 64 tape drives can be put on line in an 800 system; for the 400, the maximum is eight tape drives.

To move tape, these tape units operate on a vacuum pneumatic principle rather than the usual pinch rollers. This means that the read-write head is the only source of contact with the oxide surface of the tape. Accordingly, this method of driving tape makes for less wear and for cleaner tapes.

Other peripheral gear is the same for both computers, with the 800, in general, able to accommodate more combinations than the 400. The card reader operates at 650 c.p.m. and the card punch at 250 c.p.m. The printer operates at 900 l.p.m. with 120 print positions for the 400 but with 120 out of an available 160 print positions for the 800. Paper tape equipment is available but no random access devices are provided for either system.

### Simultaneous processing

Simultaneity, or the ability to perform more than one function at the same time, depends on the buffering between peripheral units and the central processor. The 800 is a completely buffered system in which read, write and compute are possible simultaneously. In addition, on a time sharing basis, the H-800 can process as many as eight independent programs in the same production pass, a procedure called parallel processing. On the other hand, the H-400 is an unbuffered system in which simultaneity is confined to reading and writing on different tape units at the same time.

Complete internal checking is featured on both Honeywell systems which assures the accuracy of input and output. However, when writing on tape there is no readback to test the validity of the data written on tape. Instead, so called Orthotronic control words are established and written on the tape. The next time the tape is input these control words often can regenerate bits which may have been lost in writing.

Honeywell has available a library of utility routines, such as sort, assembly, and the like. FACT, which embraces many of the features of COBOL, is Honeywell's automatic programming language now; COBOL will be available as well.

An average H-800 configuration of 4096 words, one tape control unit, four tape drives, card reader, card punch and high-speed printer rents for around $19,000 per month. The basic H-400 package of 1024 words, four tape drives and high-speed card printer rents for $8,660 per month. Rental rates for either system include full time maintenance service.

### The competition

In terms of the marketplace, the H-800 competes with the "Cadillacs"

like IBM's 700's and 7000's, Rem-Rand's Univac II and III, RCA's 601. The H-400 competes with Univac Solid State Computers, NCR's 315, RCA's 501, IBM 1401's at the upper end of the price scale, and with IBM's 1410 system.

In view of the more general interest in and utility of systems on the order of the Honeywell 400, it might be useful here to compare some of the features of the 400 with the system which appears to be in essentially the same price category, the IBM 1410.

### Comparing H-400 and IBM 1410

The H-400 is a fixed word length machine; the IBM 1410 has variable word length. The H-400 is available with 1024, 2048 and 4096 words; the IBM 1410 has three core sizes—10, 20 or 40K (K = thousands of positions). By rough equating of fixed vs. variable length words: 1024 H-400 words equal 10,000 IBM 1410 core positions in effective utilization, 2048 words equal 20,000 IBM core positions, 4096 words equal 40,000 IBM core positions.

In tape systems the H-400 comes in one tape speed with up to eight drives maximum on-line; the IBM 1410 is offered with a choice of three different drives and speeds and up to 20 units on-line. Passing speed favors the H-400 which passes tape at 96,000 decimal digits or 64,000 alphabetic characters per second whereas the IBM 1410 has a maximum passing speed of 62,500 characters per second. However, IBM uses the two-gap head principle which means that data written on tape is immediately read back to determine its validity whereas Honeywell adds to the tape record by generating Orthotronic control words which are used to test validity of tape data whenever it is passed as input.

The H-400 has three index registers of one word each; the IBM 1410 offers 15 five-position registers. The IBM 1410 is a buffered system, the H-400 unbuffered. Therefore, overlap of read, write and compute is possible on the former, whereas only overlap of read and write on tape is possible on the latter.

Comparing internal speeds is at best difficult because the H-400 operates on fixed words, the IBM 1410 on variable length words. If data being moved consists of a few characters only, the advantage is on the side of the 1410. If eight to ten characters are to be moved, the advantage is on the side of the 400.

Even on the basis of the meager comparisions above, one can see that there are important points in favor of each system. How do you narrow down the field to come up with a choice? Simply by determining which system, all things being considered, best serves your needs. How is this determination made? By a feasibility study conducted jointly by the potential user with each of the suppliers concerned. This feasibility study, based on an adequate sample of your company's data processing problems, should provide a factual foundation on which a final selection may be made.

■ ■ ■

## —Dreyfack

*(continued from page 18)*

squeezing peeve isn't as valid as you think.

Of prime importance when probing your gripes — and no systems man worth his salt can resist a good probe—is to keep in mind that there are two basic sources of anger: the gripe provokers we can do something about, and those we can't change.

If a fellow has a bum leg, for example, or a sinus condition, or is turning bald, why build up pressure cussing about it. These are the things we have to learn to accept and adjust to.

But let's get back to friend Tom. Instead of allowing Susie Blabbermouth to get under his skin he could have devoted his energy to either changing her ways, or unloading her from his staff. If his job was getting to him he should have tried to improve his standing or else seek greener pastures.

Remember, the only kind of problem anger can solve is best illustrated by some of the most notoriously angry men the world ever knew—Mad Dog Killer Coll, Adolph Hitler and Machiavelli.

■ ■ ■




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# PRODUCTS SERVICES



### TYPETRONIC

Smith-Corona Marchant has two fully transistorized machines: an automatic writing system and a computer with typewriter input-output.

Typetronic 2215 is a business document writing system consisting of an electric typewriter with electronic components which automatically process forms by punched tape or edge punched cards, rather than from manual typing. Entries which vary from item to item can be typed directly on the form by the operator. The typewriter stops automatically at the location where the variable entry is to be made, and also punches selected entries into new punched tape, or edge punched cards, for future use, while preparing the forms.



The Typetronic 6615 is an electronic computer with electric typewriter input/output which speeds the preparation of business forms requiring calculation.

Typetronic equipment will range in price from $4000 to $9000; it is also available on lease basis.

**Circle no. 40 on reader service card.**

### UNIT SPACEFINDER

Tab Products Co. offers unit filing laterally. The basic elements of the file are Unit boxes and free-standing metal frame. The boxes, which are made of laminated fiberboard to letter or legal size, are four inches wide and slide freely back and forth on cross-rails in the frame, attached by their steel backs. Box corners are cutaway to ease finding of folders. The Unit Spacefinder truck, with space for thirty boxes on rails, puts filing on wheels for fast movement. Other accessories include a complete series of guides and folders, as well as workshelves and full length storage shelves.

**Circle no. 41 on reader service card.**



### IBM ANNOUNCEMENTS

A new low-cost version of the IBM 407 for small business, called the E407, will rent for $675 a month and sell for $37,100. The new model differs from other models in that it has less functional capacity — the E407 has 84 accumulating counters rather than the 112, 126 and 168 in other models.

Doubled numerical speed of chain printer — the 1403 now prints 1,285 lines a minute. New features are: Interchangeable Chain Cartridge Adapter (enables size, style, or arrangement of type to be changed rapidly); Numerical Print (more than doubles the output potenital of the printer). The 1403 is the printer for the 1400 computers. The new features, plus control, rent for $350 a month and sell for $14,175.

**Circle no. 42 on reader service card.**

### HONEYWELL ANNOUNCEMENTS

Minneapolis-Honeywell developed a design change in the Honeywell 400 which will about double the former announced capacity without change in price. Upped from the original estimate of 4,500 - 6,000 three-address operations a second, the new specifications are for an internal speed of 10,000 three-address operations a second (equivalent to 20,000 one-address). The 400 will be deliv-

ered in the fall of 1961, and will have both FACT business compiler and EASY assembly program. The system has also been extended by several optional features. These include a new off-line printing configuration, provision for use of up to eight high-speed magnetic tape units (four extra), card punches and paper tape equipment. The new off-line printing unit includes a printer with 120 fixed printing positions, control equipment and high-speed magnetic tape unit. It operates at 900 lines a minute, producing clean carbons. Rental for the package is $3,500.

**Circle no. 43 on reader service card.**

Honeywell has also announced a data communications system which will enable its computers to transmit and receive information over long distance lines while processing other data.

The communication system is compatible to both the H-800 and the H-400, and will work over either leased lines or toll service. Transmission by the units (H-880 and H-480) is usually at 150 characters per second. Delivery will be a year to year-and-a-half from order date.

**Circle no. 44 on reader service card.**



**NCR VERIFIER**

National Cash Register has developed a new account number verifier to detect clerical errors in entering account numbers into business machines. The transistorized verifier is used in conjunction with the NCR adding and accounting machines which generate punched paper tape or punched cards for data processing systems.

The verifier applies a simple mathematical test to every account number entered. When an entry fails the test, the verifier stops the machine until the entry is corrected. Five models, each using a different formula, are available.

**Circle no. 45 on reader service card.**

*(continued on next page)*


**OUR INK KNOW-HOW CAN HELP YOU DO A BETTER JOB IN THE TAB ROOM**



**HERE'S HOW**

Ink is ink, true, but you'd be surprised how *the right ink* can improve the appearance of data processing forms and make your tab room operation smoother.

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Ink quality? We use only top grade — smooth, non-smear, sharp, readable — for the best-looking forms possible.

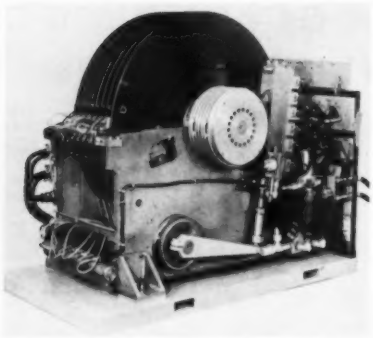
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**Circle no. 15 on reader service card.**



Full view of the delivered prototype of Bryant's new Series 4000 Disc Files. Detail view of discs and magnetic heads on prototype of Bryant's new Series 4000 Disc Files.

### MASS MEMORY DISC FILE

Bryant Computer Products Division of Ex-Cell-O Corporation has delivered the first random access, mass memory device by an independent equipment supplier to the electronic computer industry. The device is a magnetic disc file with the ability to read and write either a line-at-a-time or a character-at-a-time. The disc files will be available in capacity ranging from 30 million to 600 million bits of information. Maximum access time to all units is 167 milliseconds, including 100 milliseconds for positioning. Average access time without positioning is 34 milliseconds. Cost per bit will range from one-tenth of a cent in the smallest to one-fortieth of a cent in the largest.

The Series 4000 Disc Files are of modular construction (1-20 discs) using a common base structure and drive system housed in the base. Read/write is by six magnetic heads on a rocker arm which moves to allow each head to serve 128 tracks.

**Circle no. 46 on reader service card.**

### CURRENT DRIVERS

Digital Equipment Corporation has introduced solid-state current drivers for driving thin film and magnetic core memories.

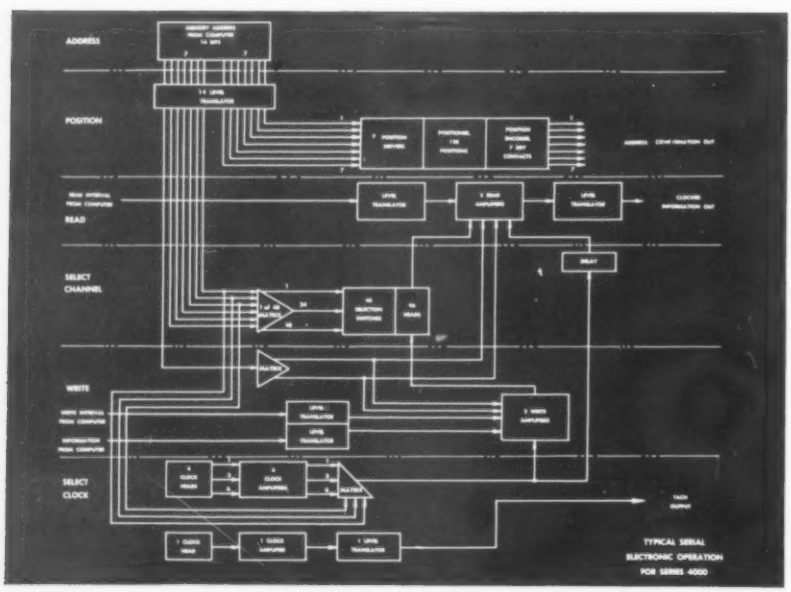
The Negative Current Driver Type 52 and the Positive Current Driver Type 62 feature a current range of 0.1 amperes and plus/minus 50 volts back voltage. Rise and fall times are 0.05 and 0.5 microseconds. Output impedance is greater than 2,000 ohms at one ampere. Seven drivers can be mounted in only 10½ inches of vertical space in a standard 19 inch rack panel.

**Circle no. 47 on reader service card.**

### FILMSORT UNIPRINTER

Minnesota Mining announces the Uniprinter 041 to make duplicate copy cards of original aperture cards at the rate of 2,000 an hour. The original aperture cards and the blank copy cards are stacked in individual feeders and fed into a pocket that moves through the exposure chamber. Duplicate copy cards emerge ready for immediate use. The machine is $25,000 installed.

**Circle no. 48 on reader service card.** ■




## DATA . . .

### yours for the asking

NATIONAL CASH REGISTER has just published a booklet on *integrated and electronic data processing* which describes the NCR machines that will control the original accounting entry; produce all necessary hard copy records; accumulate individual totals for daily balance; and fit in with any data processing system.

**Circle no. 70 on reader service card.**

CUMMINS CHICAGO CORP. has two new brochures: One explains how any *installment payment operation* can have the benefits of fully automatic document handling on an inexpensive piecework basis; the other, a 12 page booklet called "There's Safety in Numbers," explains the most common causes of overlooked invoicing and how to be sure that all shipments are billed.

**Circle no. 71 on reader service card.**

BUSINESS EFFICIENCY AIDS has case histories on the new *Magne-Tab* which describes the uses of magnetic cards by various businesses.

**Circle no. 72 on reader service card.**

PHILCO CORPORATION has two brochures: one covers the features of the *Philco 2000* data processing system in non-technical language; the second explains new optional equipment recently developed for the *2000*.

**Circle no. 73 on reader service card.**

THOMAS COLLATORS INC. offers new literature concerning its redesigned 20 and 32 sheet *tandem-type collators*.

**Circle no. 74 on reader service card.**

ARTHUR BROWN & BRO., INC., offers catalogues on a new product just introduced into this country — *instant lettering*. Instant lettering consists of 10″ x 15″ plastic sheets on which is processed a font of letters in opaque black or white. The actual lettering is transferred from the carrying sheet onto any surface with light pressure. Uses for instant lettering range from names on office doors, charts, graphs, displays, signs, slides, etc.

**Circle no. 75 on reader service card.** ■

# NEWS SUMMARY

MICR

Over half the banks in the country have already encoded their checks with the MICR characters, according to the 12 Federal Reserve Banks and 24 of their branches. Of the 15,665 banks and branches in the U. S., 8,243 have begun to encode. About 2.3 million of the 11.8 million checks handled at Federal Reserve bore the new characters.

The Third Federal Reserve District, with its IBM 1412/1401 Data Processing System, is serving 85 southern New Jersey banks with checks processed through the MICR system. The rest of the 600 banks in the district will be serviced soon.

NEW USES

RCA reports programming time cut about 30 per cent through use of COBOL at the RCA Electronic Systems Center on Wall Street.

The Research Center of the American Can Company is using a Bendix G-15 computer to correlate data on feed tests.

Connecticut's motor registration system has been computerized by C-E-I-R.

Florida's Department of Education will be the first such department with a magnetic tape computer, Rem-Rand Univac. Florida's Comptroller's office is using an IBM 1401.

The C & O Railway has ordered a million dollar communications system from Smith-Corona Marchant Inc., data from which will be computer processed.

Wyman-Gordon Company of Worcester is the first New England company to get an IBM 1401 system.

Berkshire Life Insurance Co. will process data from its 41 agencies on an RCA 301 system.

Control Data Corporation has received a microwave radio relay system for data transmission from Motorola. The system will connect computers between CDC offices in Minneapolis.

Eastern Airlines will have two Univac 490 Real Time Computers for processing data on availability of reservations, departure and arrival data.

Farrington has shown the world's first alphanumeric, transistorized commercial page reader for data processing. This will scan business documents and translate the data into punched paper tape at the rate of 240 characters a second.

Natural Gas Pipeline Company of America is sending gas meter readings by microwave more than a third of the way across the country, from Texas to the IBM 650 at Chicago which processes the information.

The Pacific Mutual Life Insurance Company announced that it ran its Univac for 1,000 consecutive days to update its 350,000 insurance policies.

A computer program of forecasting sales, developed by RCA for its own use, is being offered by that company to American business firms on a do-it-yourself basis, gratis. This consists of a manual of instructions, plus consulting support and assistance in applying the programming.

STANDARDS The Character Recognition Standards Subcommittee (X3-1) reports rapid development of an American standard for optical character recognition covering numeric font and printing specifications. This is part of the American Standards Association data processing standardization programs sponsored by the DPGroup of OEMI.

NEW FIRMS Farrington has formed the Farrington Leasing Corporation and the Farrington Leasing Corporation (Canada) Limited.

American Microwave and Television Corporation is a combination of American Microwave Division of Missile Systems Corporation of North Hollywood and the Vicon Division of Insul-8-Corp. of San Carlos. Products will be television systems and microwave electronic data transmission systems.

Litton Industries acquired the A. Kimball Company, world's largest manufacturer of point-of-sale punch-marked tags.

EXPANSIONS Honeywell EDP Division plans to hire 400 electronics service engineers in a major expansion of its field service and systems test operations. Honeywell will also build a new plant in Billerica, a Boston suburb.

RCA is doubling its Natick, Mass. Industrial Center to take care of the upsurge of computer orders.

Digital Equipment Corporation of Maynard, Mass. has delivered its first 2104, a high speed programmable pulse generator for testing thin film and cryogenic devices.

FOREIGN An RCA 501 was operational six days after air shipment from U. S. to a Stockholm (Sweden) bank.

To establish RCA's first European data processing center, another 501 system was flown to Stockholm for use in the Datacentrallen, operated by RCA Sweden AB.

MILITARY Burroughs Corporation announced an order totaling $1,300,000 for additional electronic computers for navigation systems in U. S. Navy nuclear-powered submarines.

The medical instrumentation system of the Project Mercury capsule incorporated a series of three miniature, transistorized amplifiers developed by Thompson Ramo Wooldridge, Inc.

WILSON JONES

# GrayLine® NYLON POST BINDERS

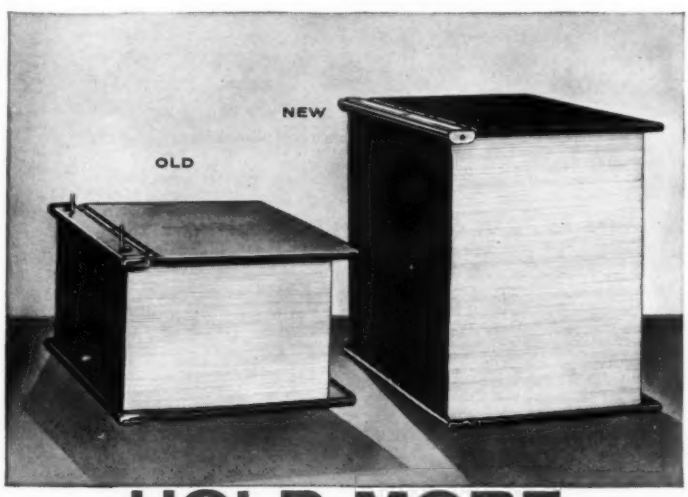
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INVENTOR OF THE NYLON POST BINDER

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Please send us complete information about GrayLine Nylon Post Binders.

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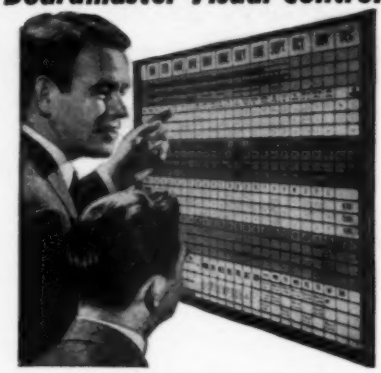
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# SEEN IN PRINT

**THE SCIENTIFIC EXTENSION OF THE HUMAN INTELLECT** by Dr. Simon Ramo, Computers and Automation, February, 1961.

This article, based on a talk before the 65th Annual Congress of American Industry, December, 1960, in New York, discusses the possible extensions of the human intellect through computer use in the future. Dr. Ramo feels that the gross imbalance between technology and the social sciences needs to be corrected. What he calls "intellectronics" will be used in law, medicine, banking, traffic control, education, and other fields. The extension of human intelligence by the machines, which are to do the routine work, leaves the human mind to cope better with solving the social progress.

**PRELUDE TO A DATA PROCESSING CENTER** by George C. Blackaller, Journal of Machine Accounting, January, 1961.

The points to consider, in setting up a center from scratch, cover floor loads, entrance problem, power requirements, ventilation, heating, lighting, floor covering, noise control, and decoration.

**MANAGEMENT CONCEPT IN ELECTRONIC SYSTEMS** by Virgil F. Blank, The Journal of Accountancy, January, 1961.

Most approaches to electronic data processing constitute patchwork solutions to over-all problems. What is needed is an engineered approach that recognizes the business enterprise as a system of interdependent parts separated into departments for organizational reasons, but not for data processing purposes. The proper goal in electronic data processing system design should be profit improvement and this implies that the systems analyst look at the business as a total operation, not as a group of individual operations in which the mechanization of data processing can be applied separately. Unique characteristics of electronic data processing are discussed in relation to problems of planning and installation.

**MATHEMATICAL MODELS IN CAPITAL BUDGETING** by James C. Hetrick, Harvard Business Review, January-February, 1961.

A new approach to the use of operations research techniques in planning, budgeting, and other strategic areas. Directions for constructing and using a model are included. ■

# BOOK SHELF

**BANKING AUTOMATION AND THE MAGNETIC INK CHARACTER RECOGNITION PROGRAM by Dale L. Reistad, Detroit Research Institute, 12 E. Hancock, Detroit, Mich., 1961, $7.50.**

This semi-technical book is designed to serve as a textbook dealing with automatic data processing for the financial industry, to give bankers a solid background in the fundamental principles, feasibility and methods of implementing MICR-ADP systems.

The text examines various approaches to banking automation — the general MICR program, the role of account numbering, control codes, the automatic processing of "on-us" documents, the automatic transit operation, sorting and filing of documents, and the role of the electronic computer in the MICR program.

**MANAGEMENT AND CORPORATIONS 1985, edited by Melvin Anshen and George L. Bach, McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y., 1960, 225 pages, $5.50.**

Fifteen eminent contributors looked into the crystal ball to see what changes were coming in economic and social areas that will significantly influence corporations, managers, and their decisions, during the next quarter of a century. They discussed what they foresaw at a symposium held for the tenth anniversary of the Graduate School of Industrial Administration, Carnegie Institute of Technology.

The principal theme of the symposium was the necessity of the corporations and their managers to effectively adapt to major changes in their environments, and covers the full scope of problems concerning the future functions and relationships of business management.

Among the papers included in this book are:

The Corporation: Will It Be Managed by Machines?
The Corporation: Its Coexistence with Men
The Corporation in a Democratic Society
The Management of the Multinational Corporation
The Western Corporation and the Underdeveloped Economies
The Corporation and Education, Ethics and Power
Management and Change
The Condition and Destination of Business Education.

Emerging from these discussions can be found guideposts for management education and training that challenge present practice.

**ELECTRONICS IN ACTION, The Current Practicality of Electronic Data Processing, Special Report No. 22, American Management Association, Inc., 1515 Broadway, New York 36, N. Y., 1961, 156 pages, $3.75 to non members.**

This material was first presented in 1957 at the Third Annual Electronics Conference and Exhibit, sponsored by the Finance Division of AMA, in New York City.

This report stresses the current practicality of electronics in action. Leading practitioners from companies with well established programs report on their experience to date in dollars and cents terms. The papers indicate that management plans to utilize the improved reporting and analysis obtained to a greater extent.

The report covers feasibility studies of small, medium and large computers, with one negative report; selecting and training personnel; appraisals of several installations; new frontiers possible through simulation of inventory control, expansion planning, and design of business organization; and the future of electronics as a management tool. ■


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# editorial

## Has Top Management Been Ignored?

QUESTIONS AND INQUIRIES from our readers have brought to light a problem of considerable importance in the field of data processing. Perhaps the best way to focus on this problem is to ask the question, "Is top management in American business getting information about the application of electronic data processing systems in its most useful form?" That is, the form upon which an executive can make the correct decision.

The executive management of most organizations must concern themselves with competent decision making problems, apart from policy making and organizational development. The problem of using electronic data processing systems effectively is a constant one demanding repeated consideration.

To date, this problem has been solved by reliance on the equipment manufacturer and the natural single system orientation characteristic of a salesman, or on the efforts of his industrial associates. Thus covering in a general way the impact of electronic data processing in his specific industry.

The consultant represents another means of solving the problem of automating paper work. However, his services represent a discrete experience which may interject new problems into the operation.

The final alternative to solving the problem is to rely on the executives' own faith in a staff of specialists, whose skills ten years ago did not exist, to solve the managerial, organizational, and technical problems inherent in data automation. Taking our readers requests to heart, we have investigated information sources in the spirit of improving electronic data processing information for management as it is handled in the area of most seminar and colloquial meetings. We have found that this single source of information has not been developed in terms of the need of the corporative executive. It is our view that there is a greater need today than ever before, to orient and inform top management as to the implication, application and development of electronic data processing in terms of management policies, organization effectiveness, and operational efficiency. ■

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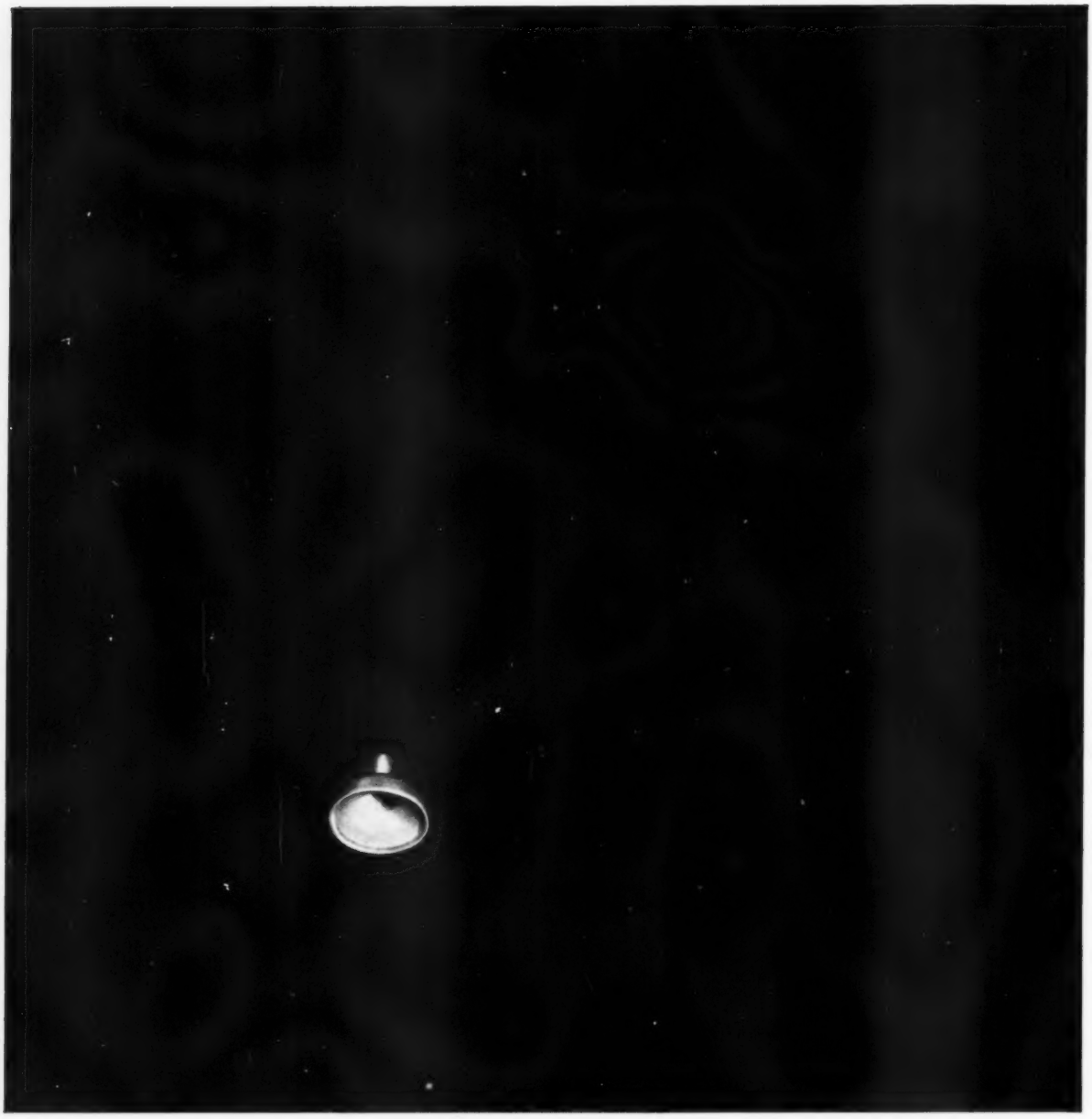
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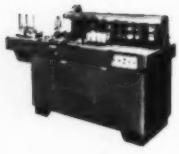
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